



Test Report

FCC Part 15.247

DTS Devices operating in range 2400-2483.5MHz

FOR:

Model Name: P121UEU
FCC ID: O8F-PIXYW

TEST REPORT #: EMC_ PALMO_070_09001_15.247_WLAN_Conducted_rev1
DATE: 2010-03-16



**Bluetooth Qualification
Test Facility
(BQTF)**



**FCC listed:
A2LA
accredited**

**IC recognized #
3462B**

CETECOM Inc.

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CETECOM Inc. is a Delaware Corporation with Corporation number: 2113686

Board of Directors: Dr. Harald Ansorge, Dr. Klaus Matkey, Hans Peter May

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1 Assessment

The following is in compliance with the applicable criteria specified in FCC rules Part 15.247 of the Code of Federal Regulations. Only conducted measurements are reported here.

Company	Description	Model #
Palm, Inc	GSM Phone with 802.11 b/g and Bluetooth	P121UEU

This report is reviewed by:

Marc Douat

2010-03-16 EMC & Radio

(Test Lab Manager)

Date

Section

Name

Signature

This report is prepared by:

Josie Sabado

2010-03-16 EMC & Radio

(EMC Project Engineer)

Date

Section

Name

Signature

The test results of this test report relate exclusively to the test item specified in Identification of the Equipment under Test. The CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM Inc USA.

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the EMC Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Address:	411 Dixon Landing Road Milpitas, CA 95035 U.S.A.
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
Responsible Test Lab Manager:	Heiko Strehlow
Responsible Project Leader:	Josie Sabado

2.2 Identification of the Client

Applicant's Name:	Palm, Inc.
Street Address:	950 W. Maude Ave
City/Zip Code	Sunnyvale, CA 94085-2801
Country	USA
Contact Person:	Julia Luke
Phone No.	(408) 617-8597
e-mail:	Julia.Luke@palm.com

2.3 Identification of the Manufacturer

Same as above client.

3 Equipment under Test (EUT)**3.1 Specification of the Equipment under Test**

Model No:	P121UEU
Product Type:	GSM Cellular Phone
Hardware Revision :	DVT2B
Software Revision :	Utility Software Build: 920
FCC-ID:	O8F-PIXYW
Frequency:	2400-2483.5 MHz
Type(s) of Modulation:	CCK, OFDM
Number of channels:	11
Antenna Type:	Integral
Equipment Classification:	☐ Fixed ☐ Vehicular ☒ Portable ☐ Module

3.2 Identification of the Equipment under Test (EUT)

EUT #	Serial Number	HW Version	SW Version	Comments
1	PD2BNBR98115	DVT2B	Utility Software Build: 920	Radiated sample
2	PD2BNBR98112	DVT2B	Utility Software Build: 920	Conducted sample

3.3 Identification of Accessory equipment

AE #	Type	Manufacturer	Model	Serial Number	Part Number
1	Battery	Palm	N/A	D298AW18D1BDC090810	157-10119-00
2	Inductive Charging Dock	Palm	N/A	N/A	157-10123-00
3	Inductive Back Cover	Palm	N/A	P29BJ0L4C4A	180-10763-00
4	Headset	Palm	N/A	N/A	180-10632-00
5	AC Adapter #24	Palm	N/A	2B9840MTP2A	157-10124-00
6	AC Adapter #30	Palm	N/A	F298R03TP34	157-10130-00
7	USB Cable	Palm	N/A	N/A	180-10646-00

4 Subject Of Investigation

All testing was performed on the product referred to in Section 3 as EUT. EUT operates in the band 2400-2483.5MHz in 802.11b/g mode. All measurements were made with transmit power set to 13.

The objective of the measurements done by Cetecom Inc. was to measure the performance of the EUT operating under all operating modes as per requirements listed in FCC rules Part 15.247 of Title 47 of the Code of Federal Regulations. The maximization of portable equipment is conducted in accordance with ANSI C63.4

Only conducted measurements shown here.

Replaces previous report number EMC_PALMO_070_09001_15.247_WLAN_Conducted

5 Conducted Measurements

5.1 6dB bandwidth and 99% bandwidth

5.1.1 Limit

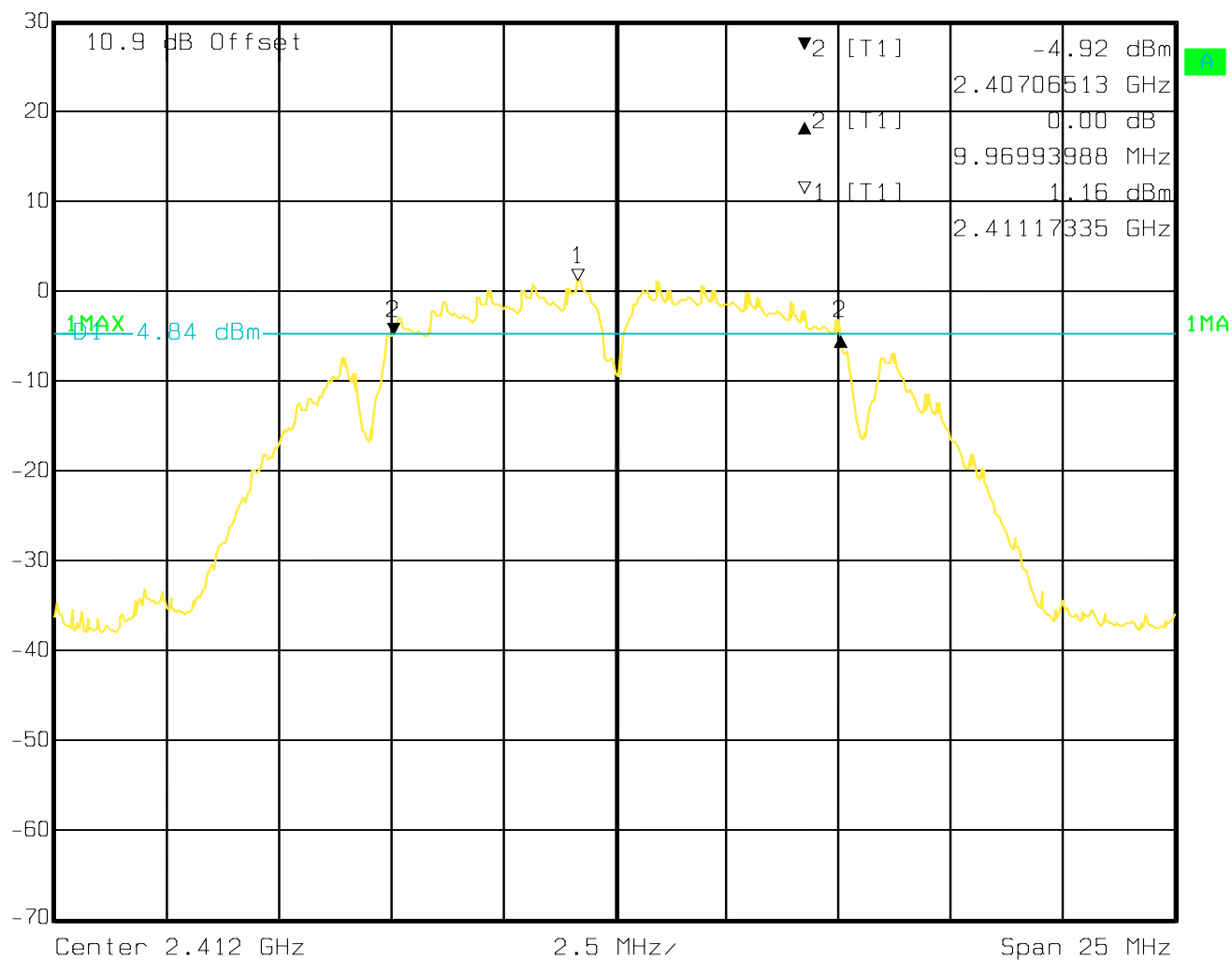
FCC15.247(a)(2) Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

5.1.2 Measurement Result:

	Channel Frequency (MHz)	6dB Bandwidth (MHz)	20dB/99% Bandwidth (MHz)
2400-2483.5 MHz (802.11 b)	2412	9.97	13.83
	2437	10.17	13.73
	2462	10.12	13.78
2400-2483.5 MHz (802.11 g)	2412	16.63	16.78
	2437	16.63	16.78
	2462	16.68	16.78

5.1.3 Plots:**6dB bandwidth, 802.11 b, Channel 1**

 Delta 2 [T1] RBW 100 kHz RF Att 40 dB
Ref Lvl 0.00 dB VBW 100 kHz
30 dBm 9.96993988 MHz SWT 6.5 ms Unit dBm

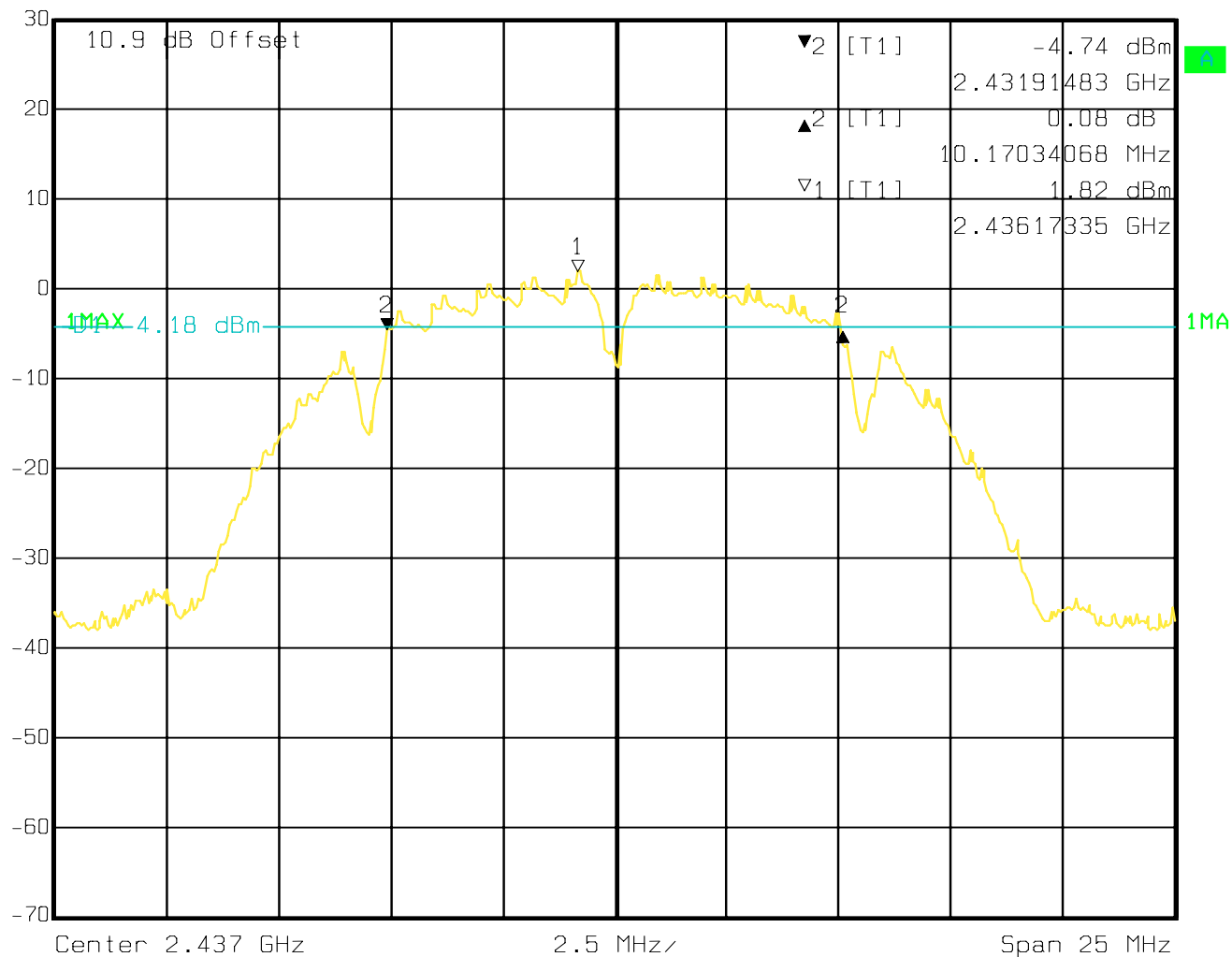


Date: 13.JAN.2010 16:19:10

6dB bandwidth, 802.11 b, Channel 6



Ref Lvl 30 dBm
 Delta 2 [T1] 0.08 dB
 10.17034068 MHz
 RBW 100 kHz RF Att 40 dB
 VBW 100 kHz
 SWT 6.5 ms Unit dBm

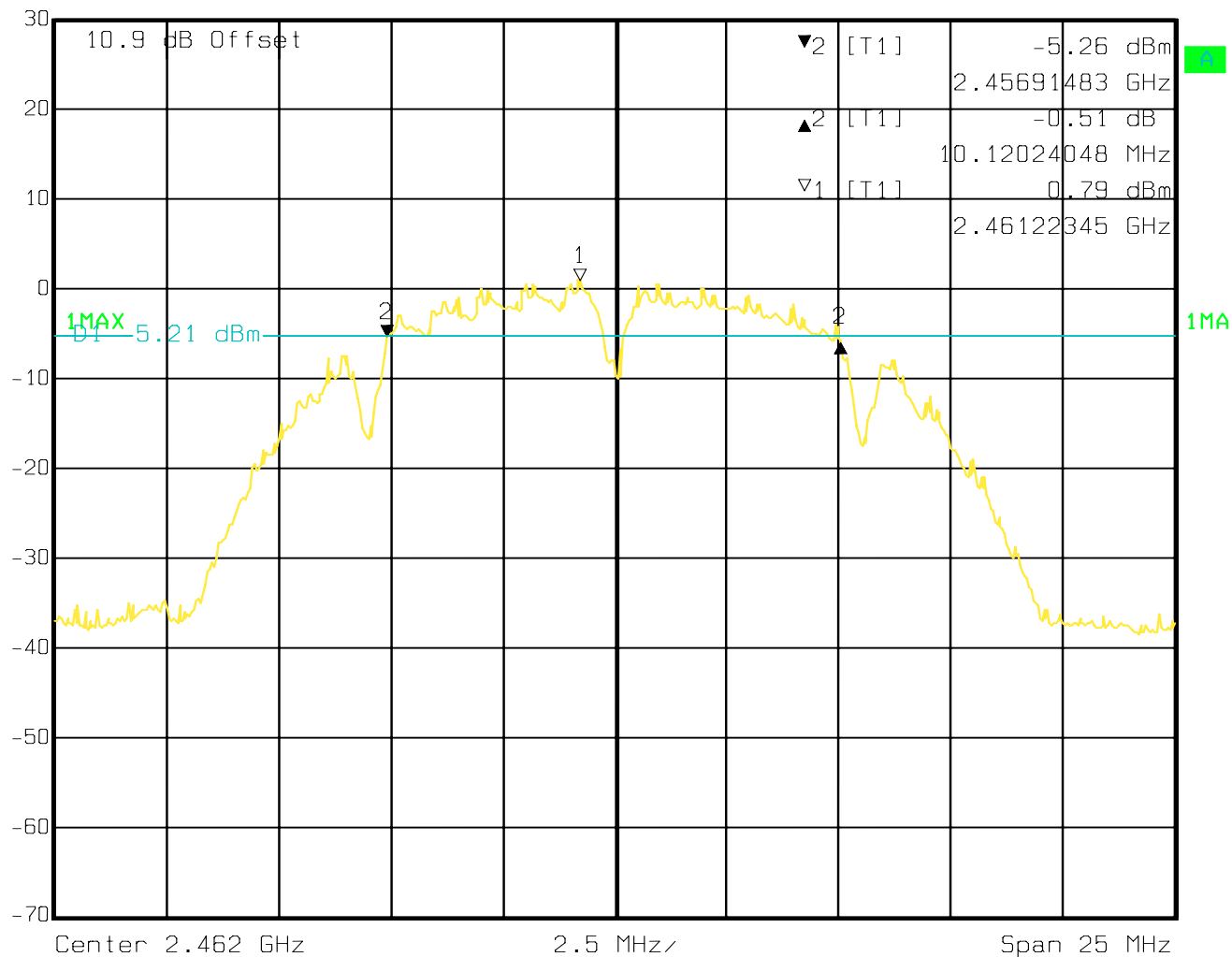


Date: 13.JAN.2010 16:16:40

6dB Bandwidth, 802.11 b, Channel 11



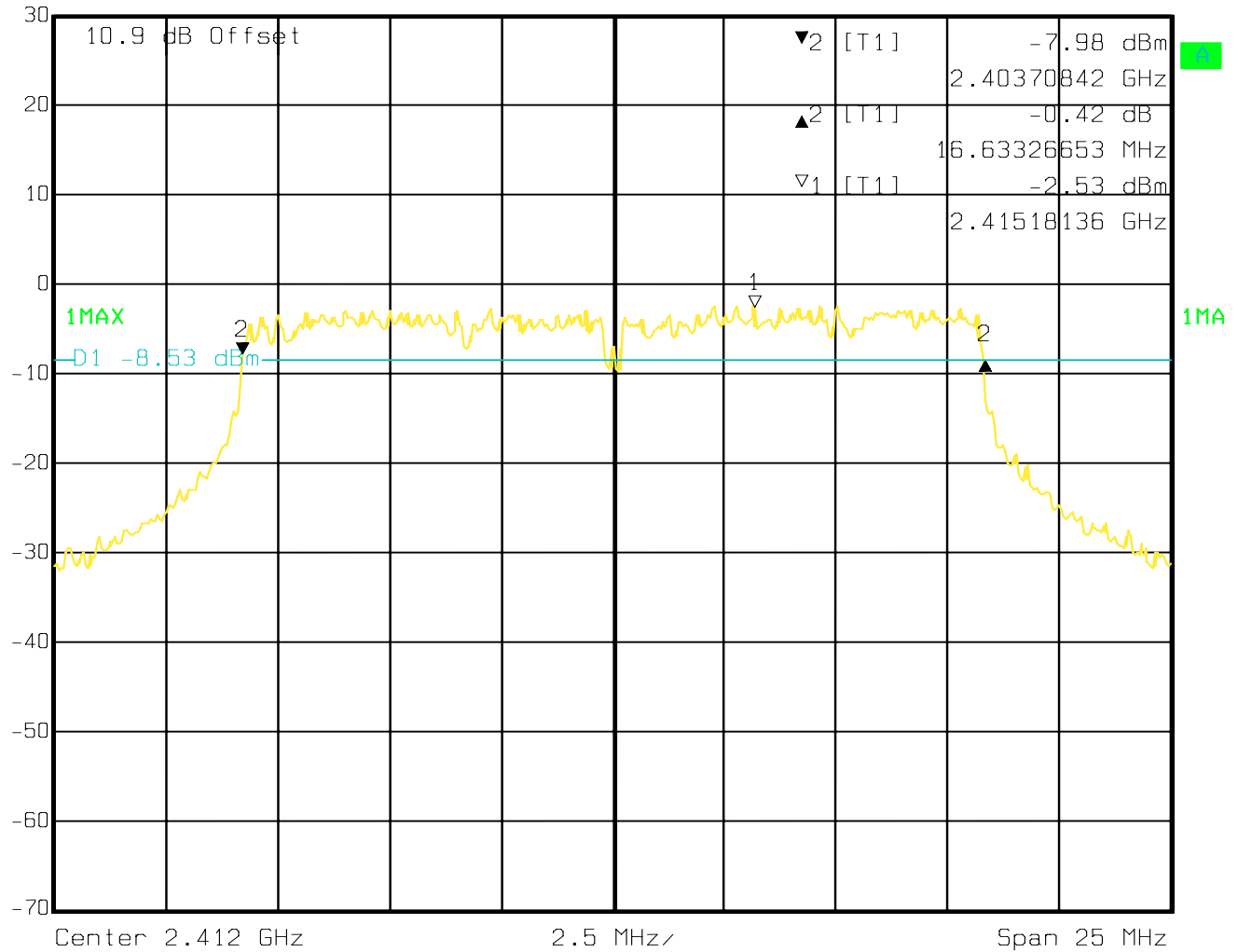
Ref Lvl 30 dBm
 Delta 2 [T1] -0.51 dB
 10.12024048 MHz
 RBW 100 kHz RF Att 40 dB
 VBW 100 kHz
 SWT 6.5 ms Unit dBm



Date: 13.JAN.2010 16:13:50

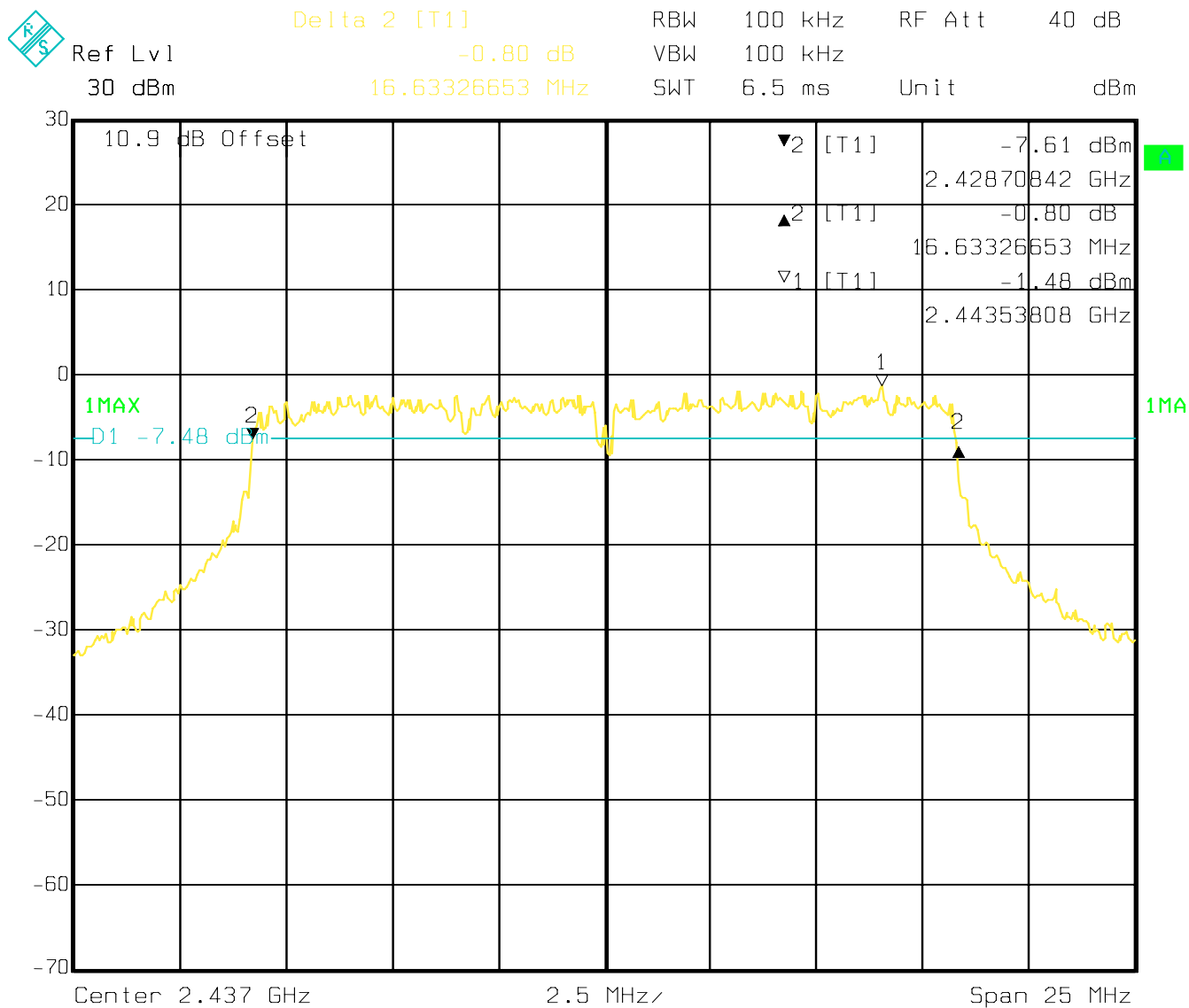
6dB Bandwidth, 802.11 g, Channel 1


 Ref Lvl 30 dBm
 Delta 2 [T1] -0.42 dB
 16.63326653 MHz
 RBW 100 kHz RF Att 40 dB
 VBW 100 kHz
 SWT 6.5 ms Unit dBm



Date: 13.JAN.2010 16:22:07

6dB Bandwidth, 802.11 g, Channel 6



Date: 13.JAN.2010 16:24:24

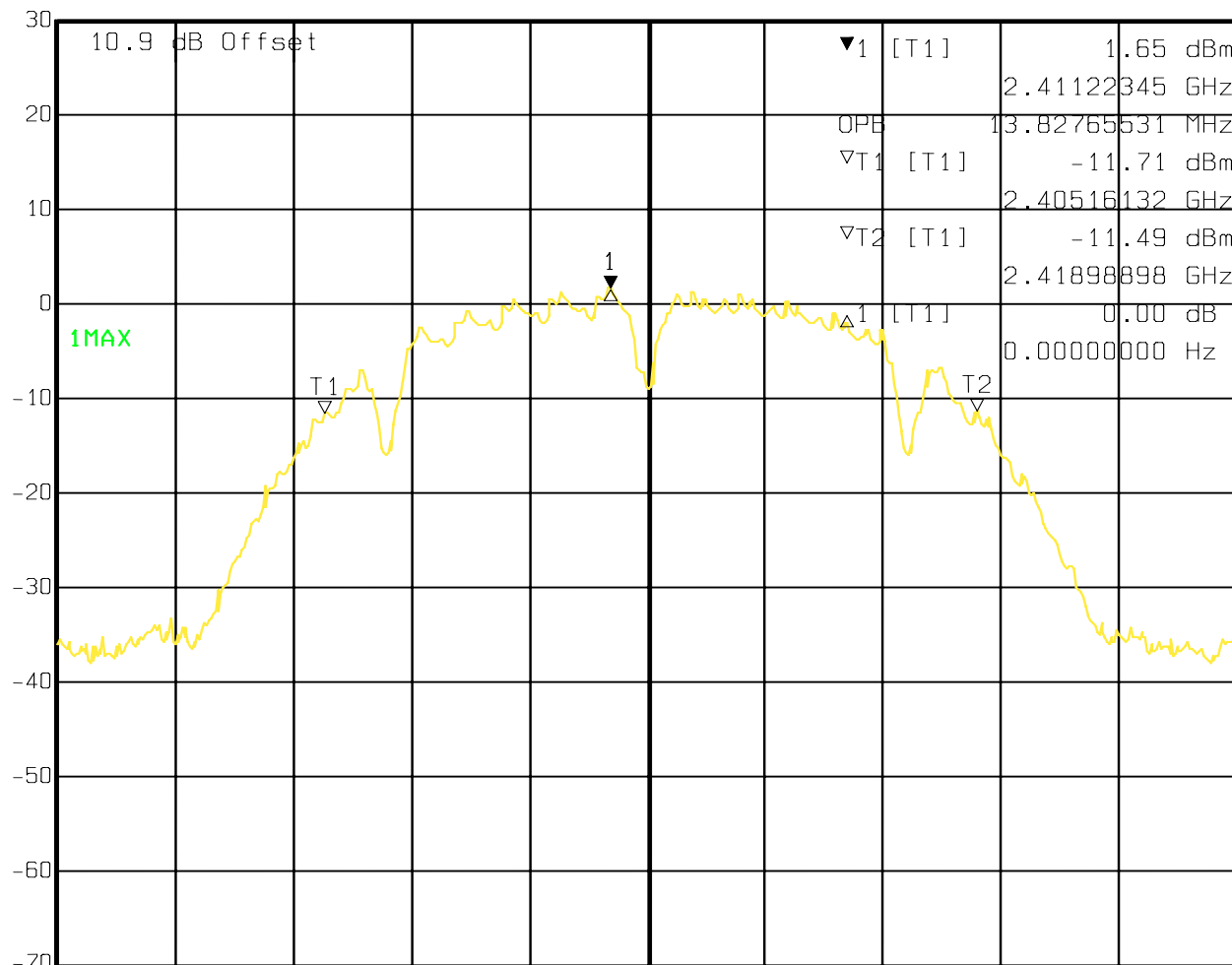
SWT 6.5 ms Unit dBm



99% Bandwidth, 802.11 b, Channel 1



Ref Lvl 30 dBm
 Marker 1 [T1] 1.65 dBm
 2.41122345 GHz
 RBW 100 kHz RF Att 40 dB
 VBW 300 kHz
 SWT 6.5 ms Unit dBm



Center 2.412 GHz

2.5 MHz

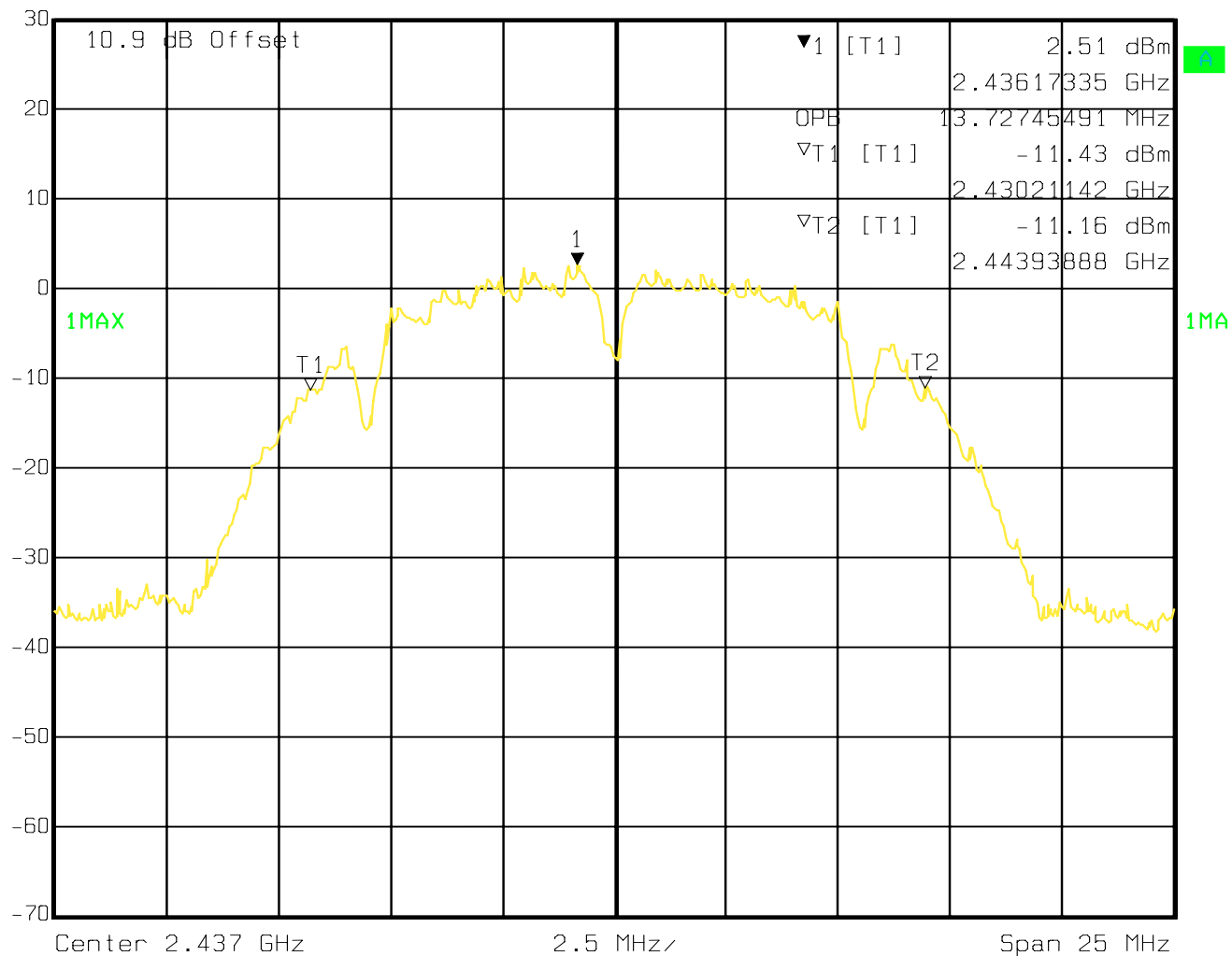
Span 25 MHz

Date: 13.JAN.2010 16:30:12

99% Bandwidth, 802.11 b, Channel 6



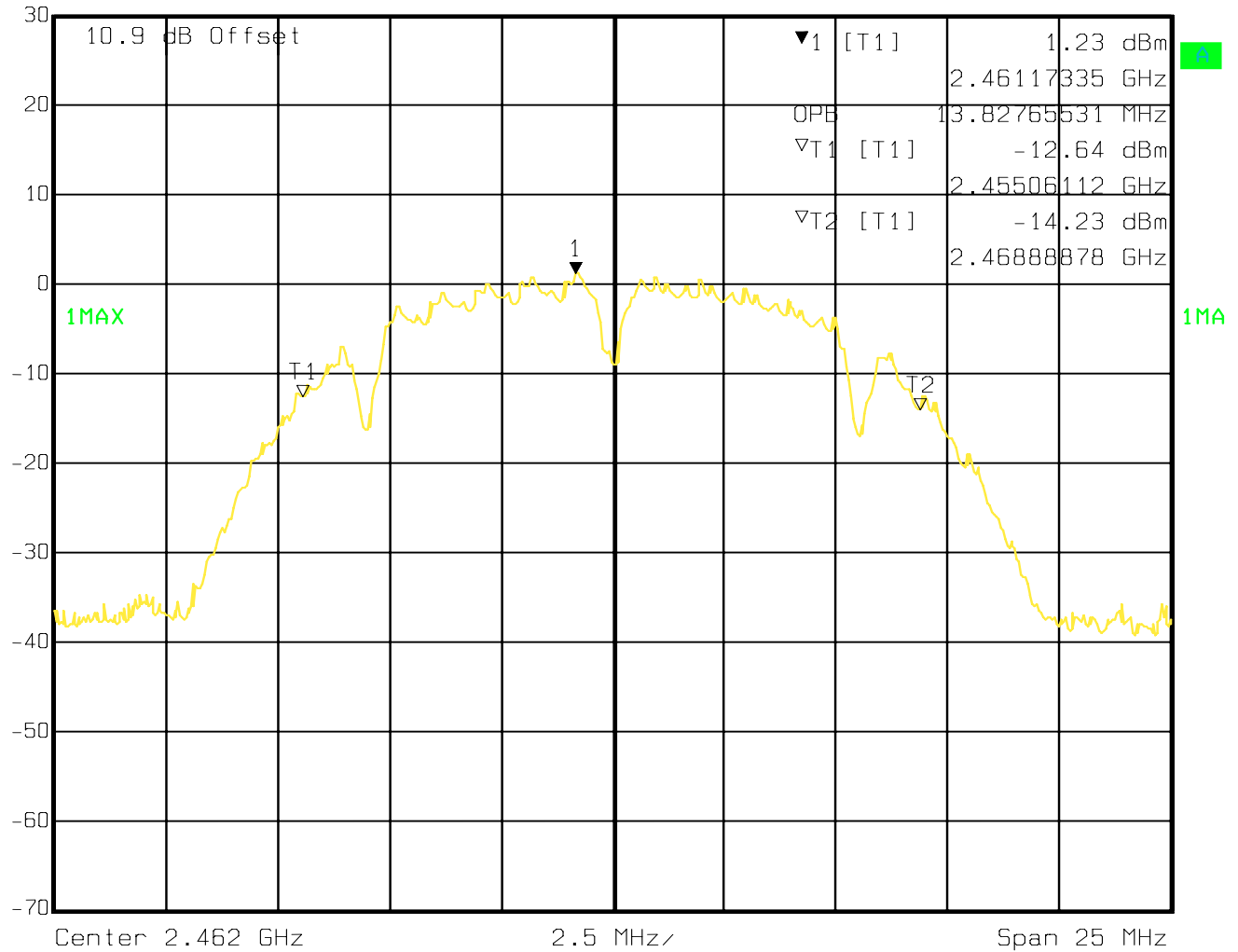
Ref Lvl 30 dBm
 Marker 1 [T1] 2.51 dBm
 2.43617335 GHz
 RBW 100 kHz RF Att 40 dB
 VBW 300 kHz
 SWT 6.5 ms Unit dBm



Date: 13.JAN.2010 16:32:03

99% Bandwidth, 802.11 b, Channel 11

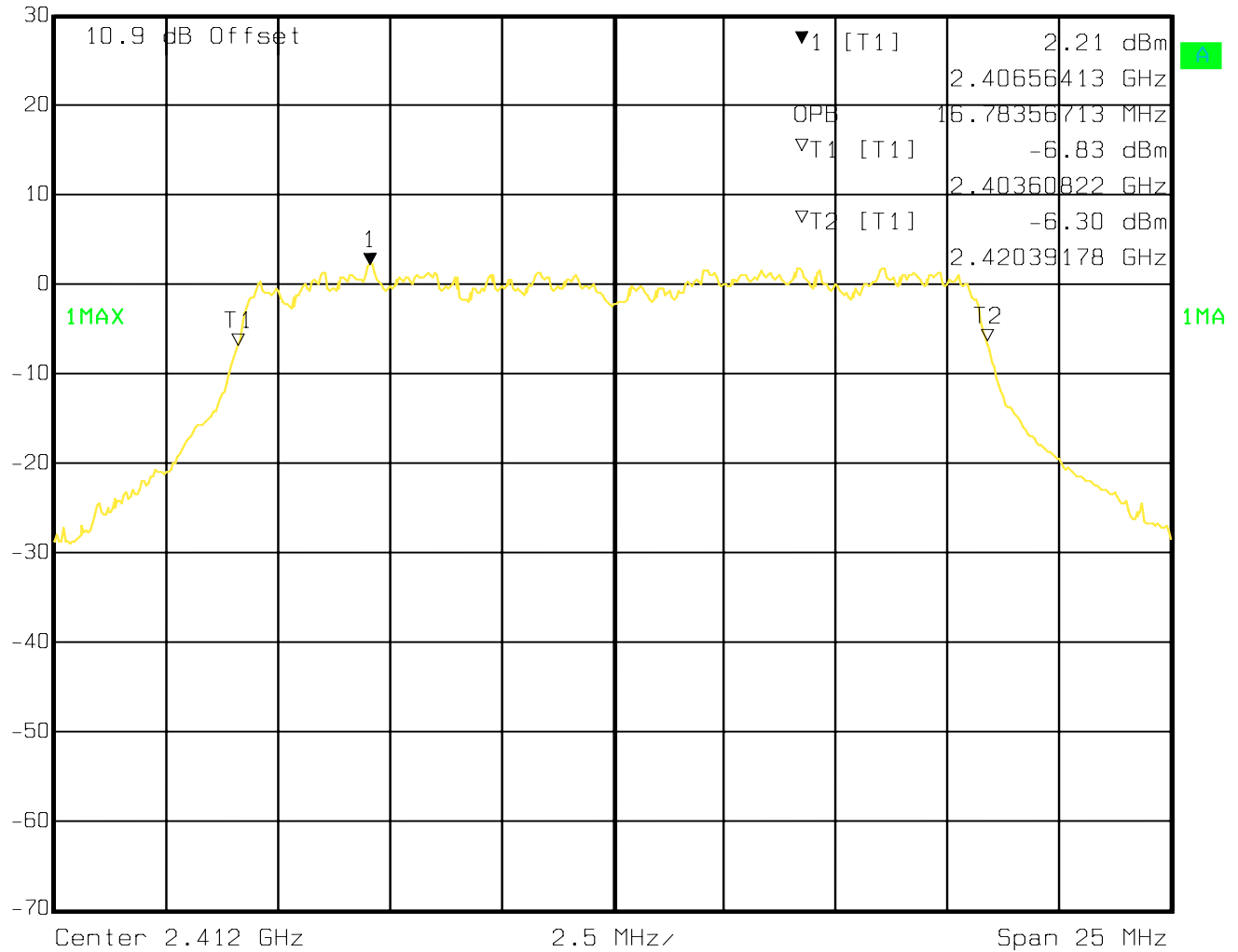

 Ref Lvl 30 dBm
 Marker 1 [T1] 1.23 dBm
 2.46117335 GHz
 RBW 100 kHz RF Att 40 dB
 VBW 300 kHz
 SWT 6.5 ms Unit dBm



Date: 13.JAN.2010 16:33:32

99% Bandwidth, 802.11 g, Channel 1

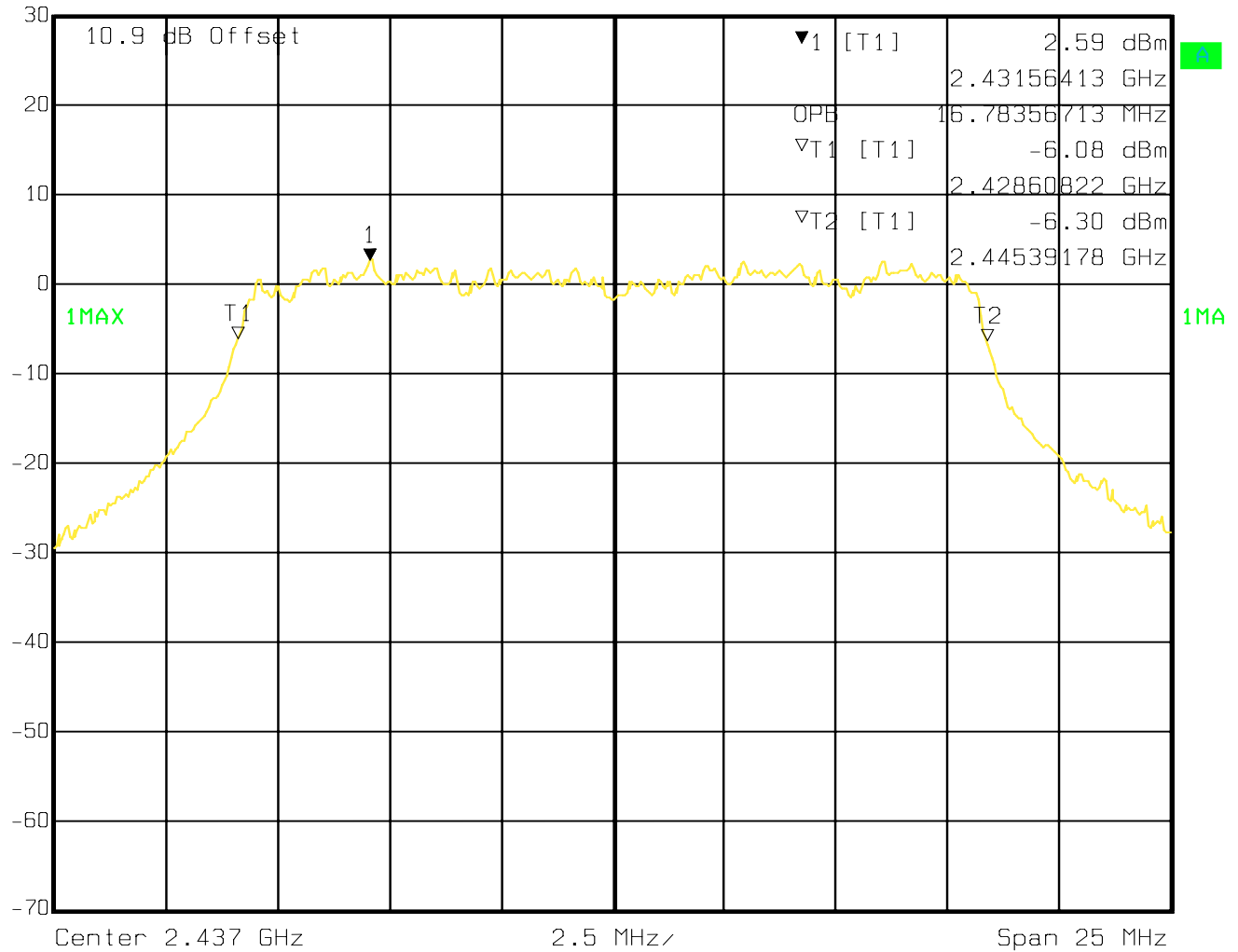

 Ref Lvl 30 dBm
 Marker 1 [T1] 2.21 dBm
 2.40656413 GHz
 RBW 200 kHz RF Att 40 dB
 VBW 1 MHz
 SWT 5 ms Unit dBm



Date: 13.JAN.2010 16:39:13

99% Bandwidth, 802.11 g, Channel 6

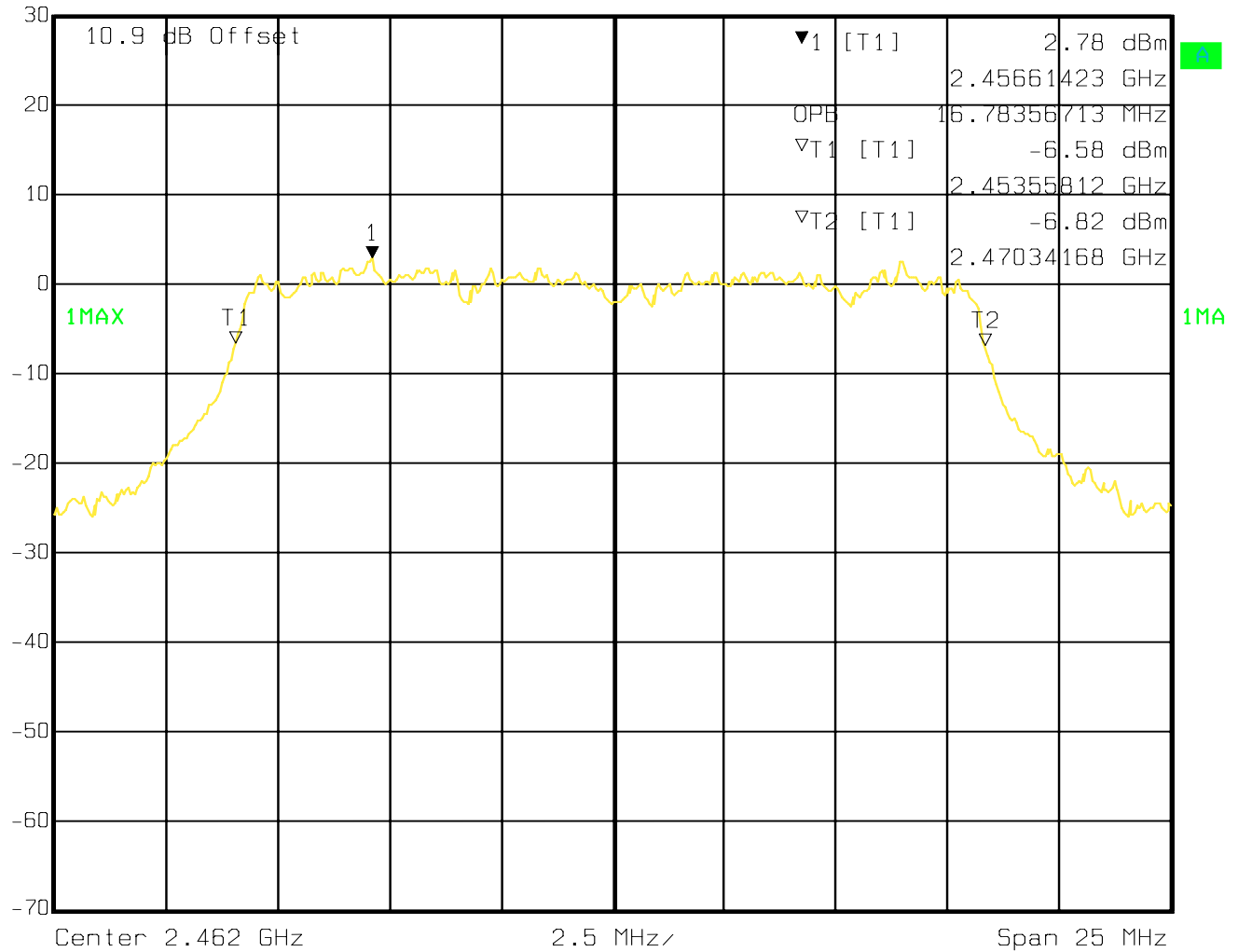

 Ref Lvl 30 dBm
 Marker 1 [T1] 2.59 dBm
 2.43156413 GHz
 RBW 200 kHz RF Att 40 dB
 VBW 1 MHz
 SWT 5 ms Unit dBm



Date: 13.JAN.2010 16:37:55

99% Bandwidth, 802.11 g, Channel 11


 Marker 1 [T1] RBW 200 kHz RF Att 40 dB
 Ref Lvl 2.78 dBm VBW 1 MHz
 30 dBm 2.45661423 GHz SWT 5 ms Unit dBm



Date: 13.JAN.2010 16:36:32

5.2 Conducted Power Measurement

5.2.1 Limit

FCC15.247 (b)(3): For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt

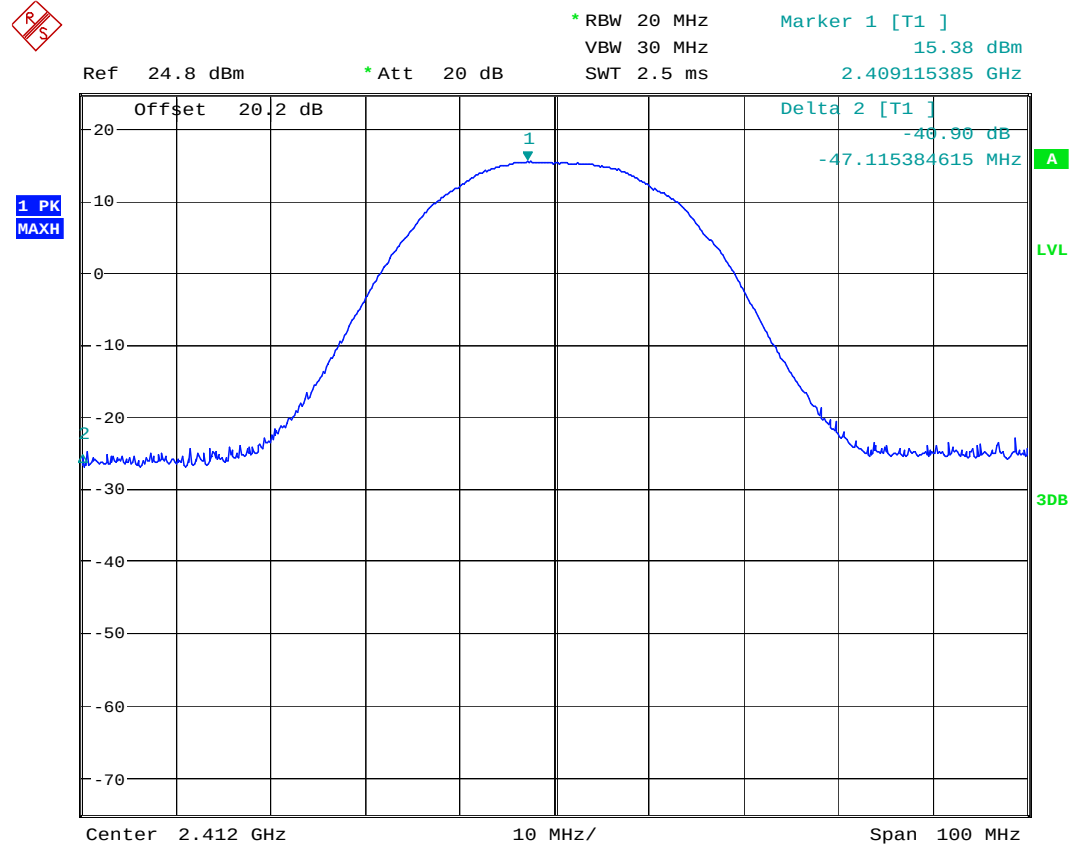
5.2.2 Results

Conducted power measurements were made using a spectrum analyzer and a peak power meter.

TEST CONDITIONS $T_{nom}(23)^{\circ}C$, $V_{nom}VDC$	Channel Frequency	Peak (dBm)	Peak (mW)	Verdict
Sub-band 1: 2400-2483.5MHz (802.11b)	2412	15.38	34.51	PASS
	2437	16.33	42.95	PASS
	2462	15.45	35.08	PASS
Sub-band 1: 2400-2483.5MHz (802.11g)	2412	20.60	114.82	PASS
	2437	21.28	134.28	PASS
	2462	20.21	104.95	PASS

5.2.3 Test Plots:

802.11b 2412MHz



Date: 9.FEB.2010 10:20:18

802.11b 2437MHz



* RBW 20 MHz

Marker 1 [T1]

VBW 30 MHz

16.33 dBm

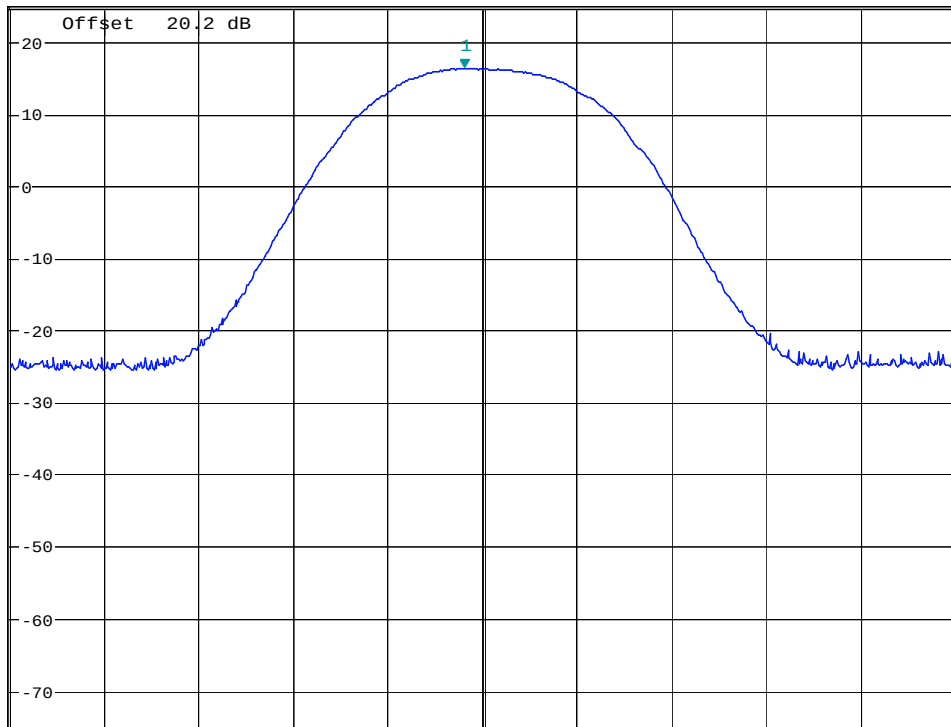
SWT 2.5 ms

2.435076923 GHz

Ref 24.8 dBm

* Att 20 dB

1 PK
MAXH



Center 2.437 GHz

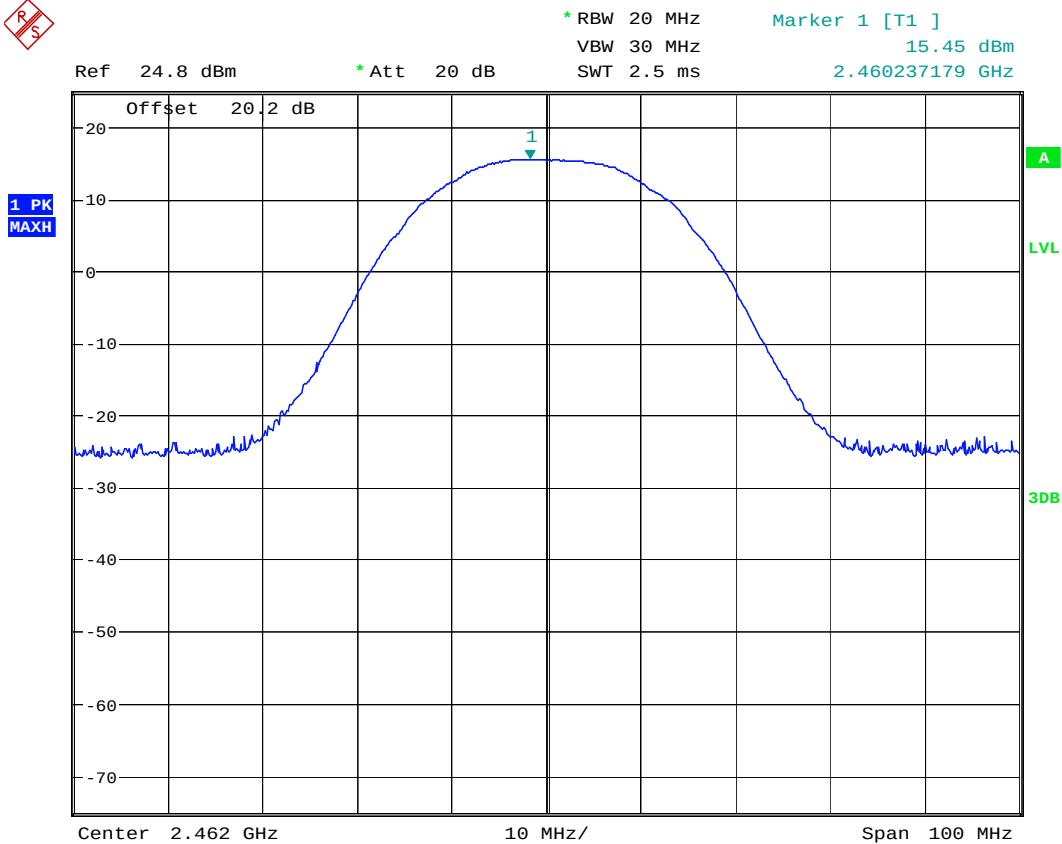
10 MHz/

Span 100 MHz

Date: 9.FEB.2010 10:22:17

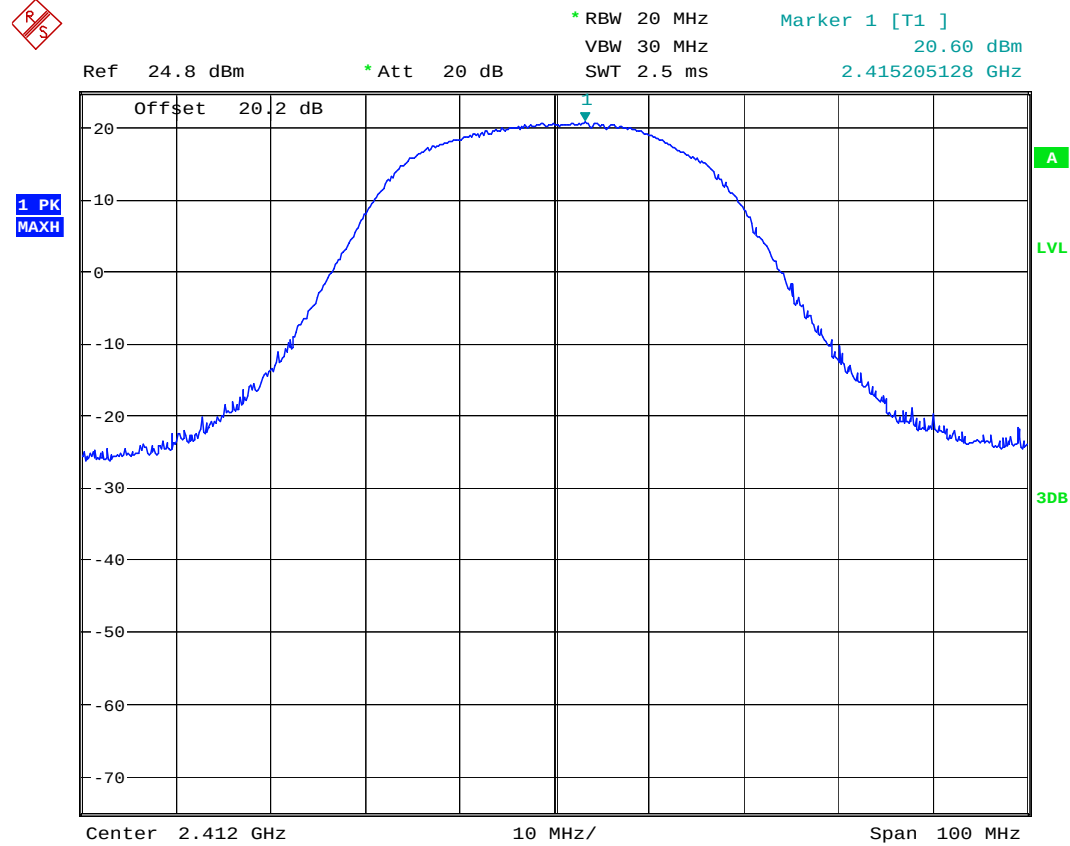


802.11b 2462MHz



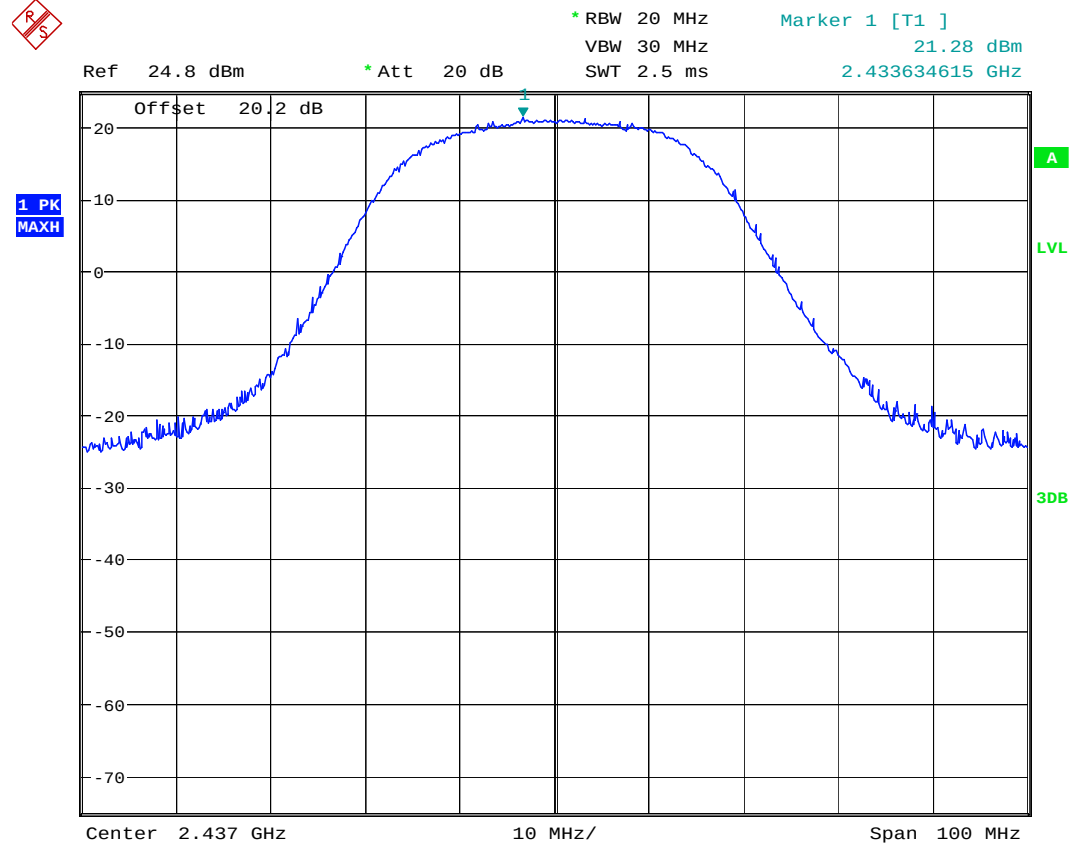
Date: 9.FEB.2010 10:23:17

802.11g 2412MHz



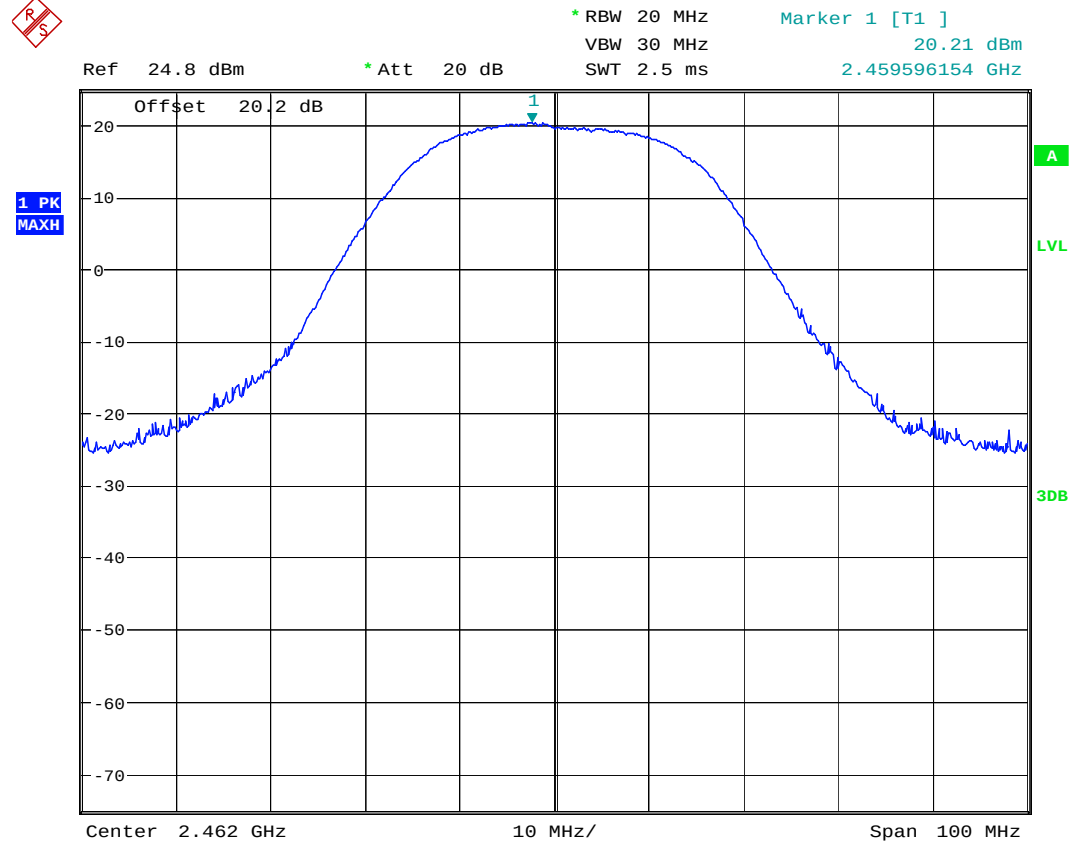
Date: 9.FEB.2010 10:25:21

802.11g 2437MHz



Date: 9.FEB.2010 10:24:41

802.11g 2462MHz



Date: 9.FEB.2010 10:24:13

5.3 Power Spectral Density

5.3.1 Limit

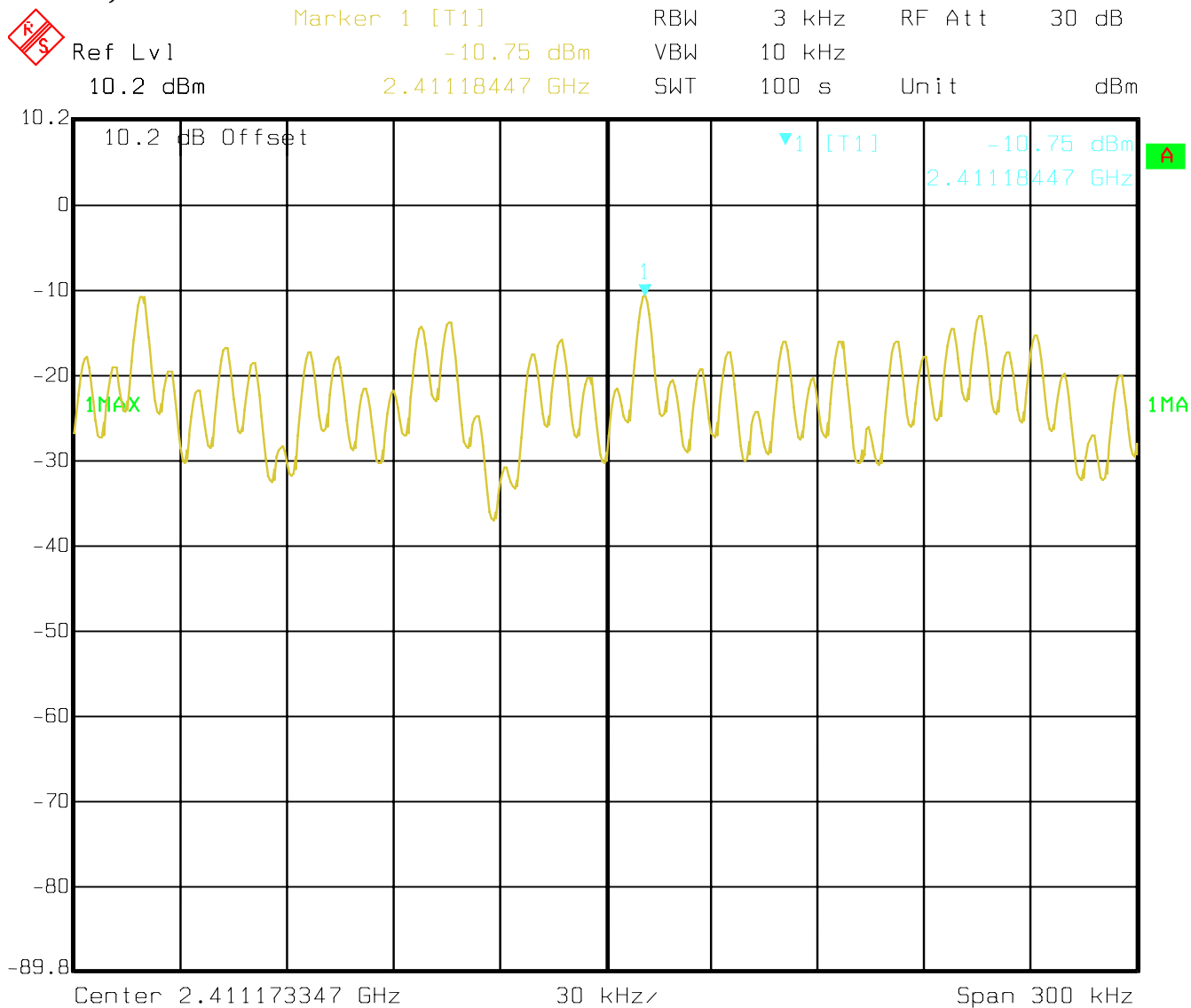
FCC 15.247 (e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

5.3.2 Results

TEST CONDITIONS $T_{nom}(23)^{\circ}C$, $V_{nom}VDC$	Channel Frequency	PSD (dBm)	Verdict
Sub-band 1: 2400-2483.5MHz (802.11b)	2412	-10.75	PASS
	2437	-9.83	PASS
	2462	-10.85	PASS
Sub-band 1: 2400-2483.5MHz (802.11g)	2412	-16.39	PASS
	2437	-17.58	PASS
	2462	-17.70	PASS

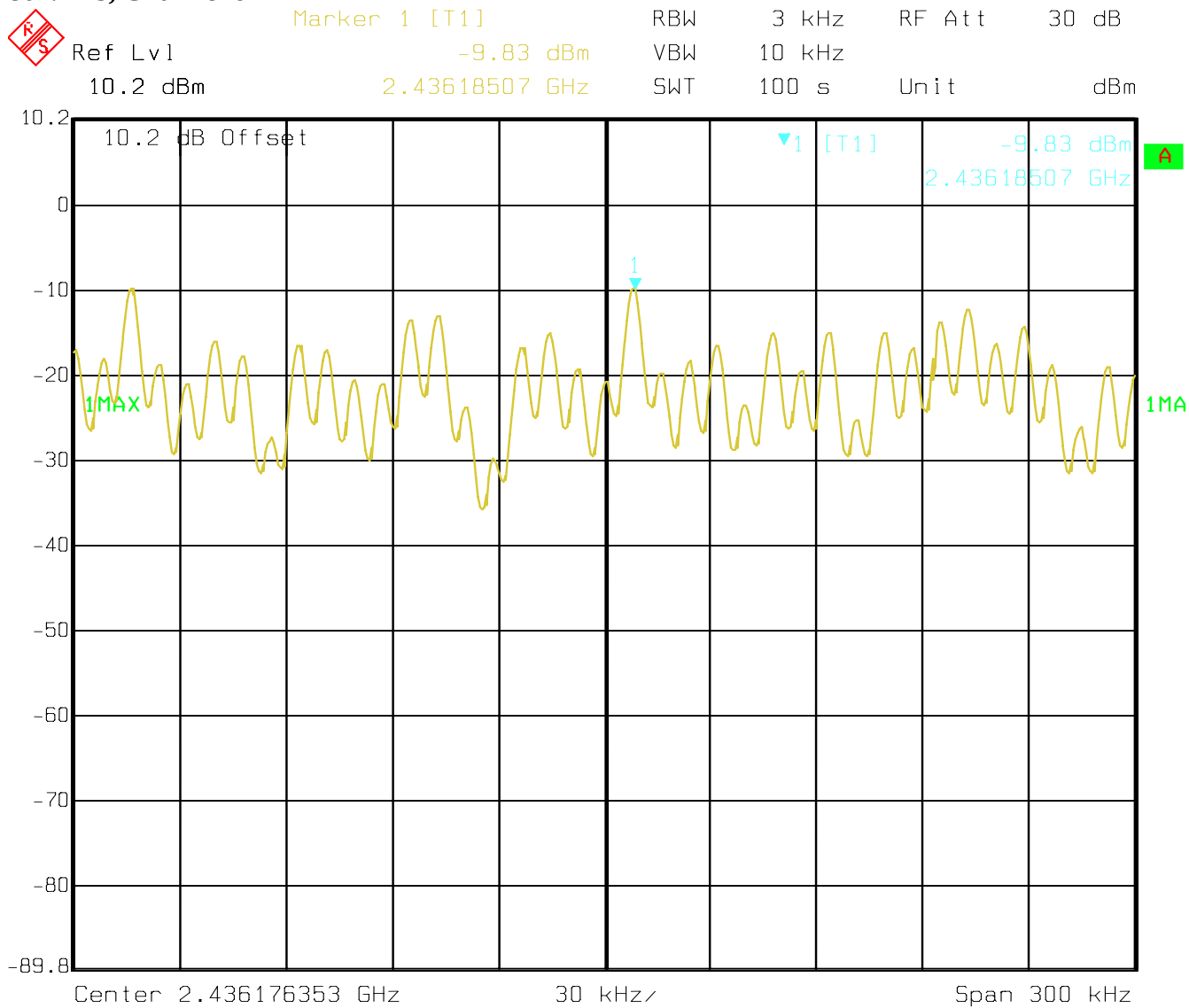
5.3.3 Plots

802.11 b, Channel 1



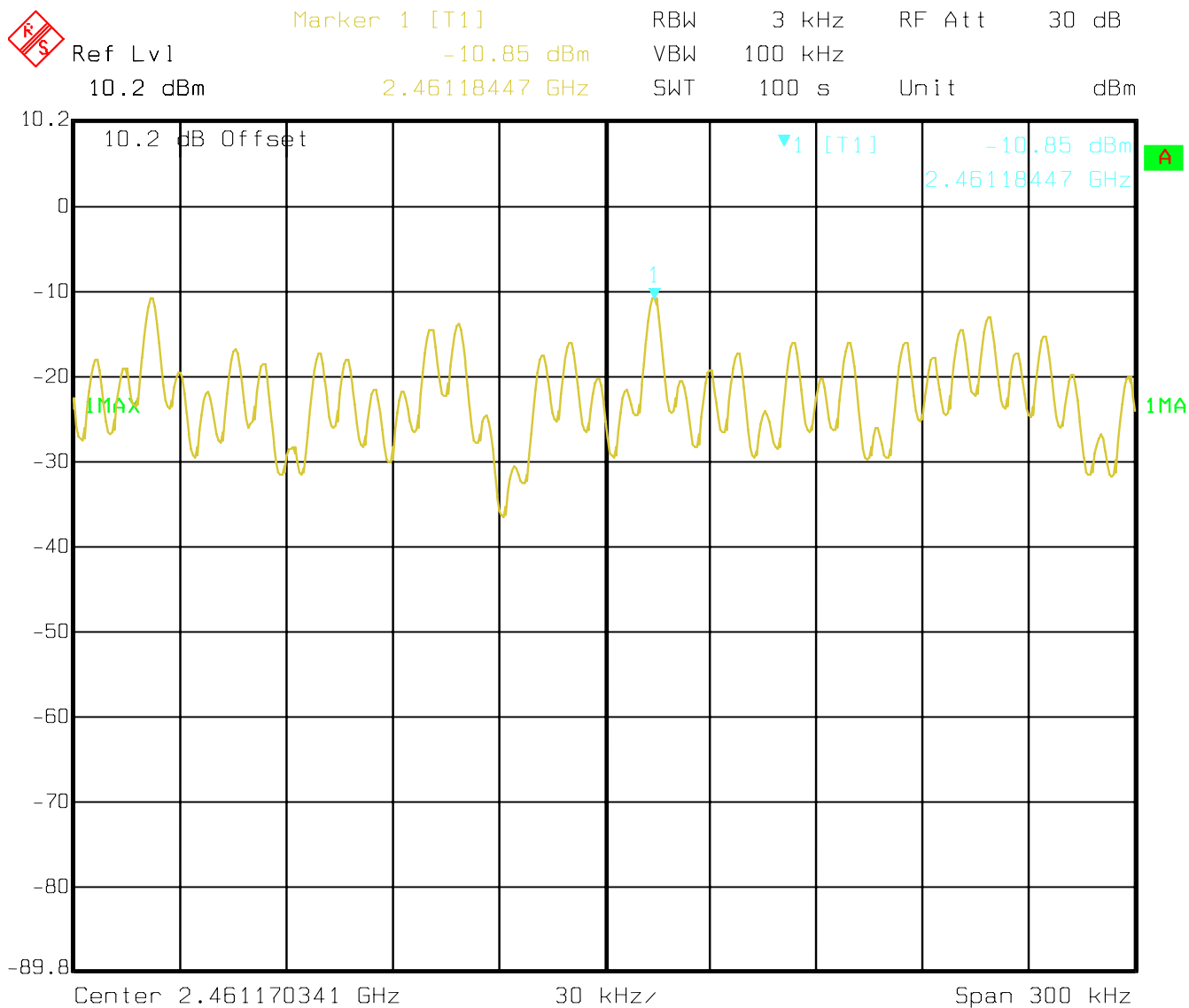
Date: 12.FEB.2010 15:13:44

802.11 b, Channel 6



Date: 12.FEB.2010 15:38:34

802.11 b, Channel 11

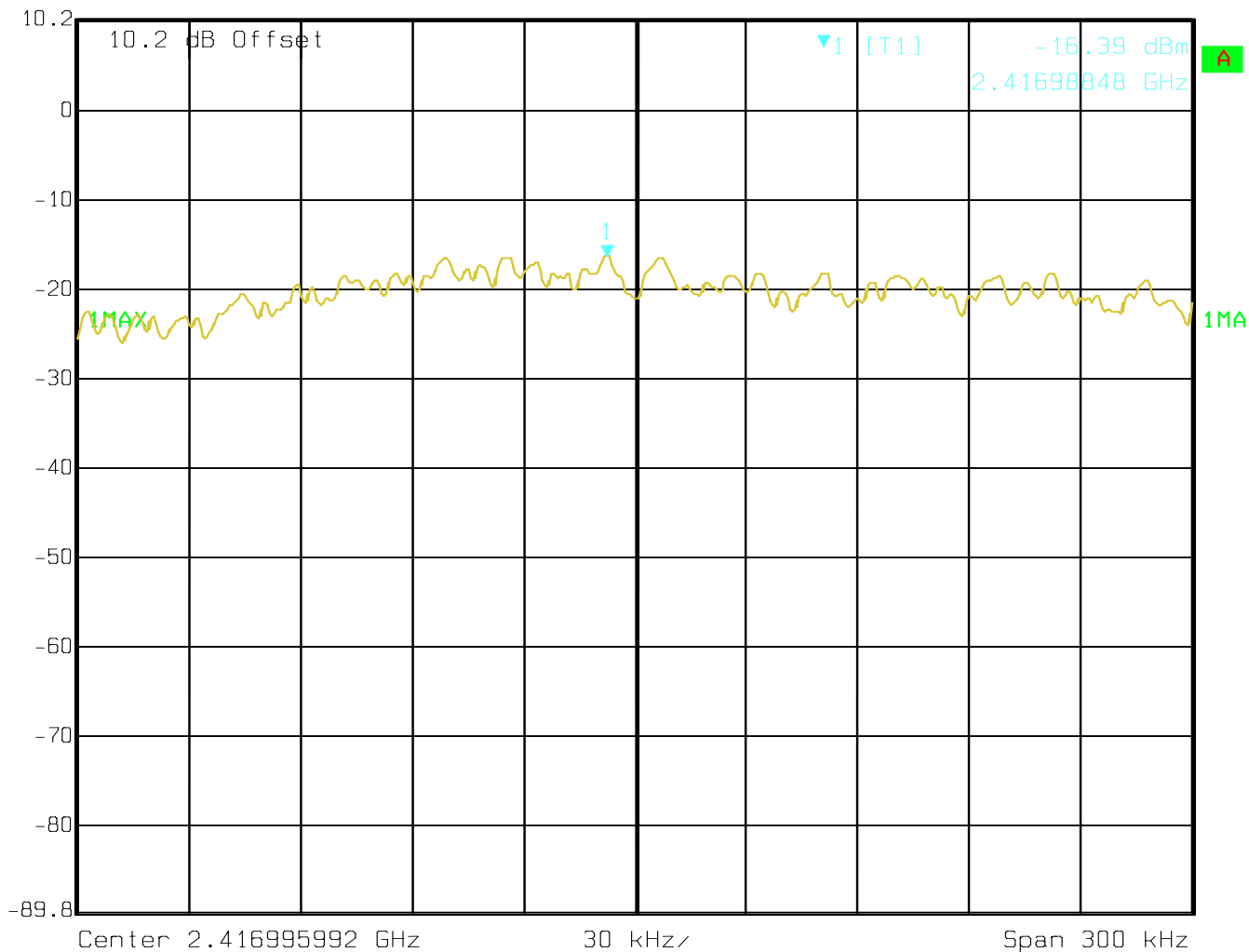


Date: 12.FEB.2010 15:46:07

802.11 g, Channel 1



Marker 1 [T1] RBW 3 kHz RF Att 30 dB
 Ref Lvl -16.39 dBm VBW 10 kHz
 10.2 dBm 2.41698848 GHz SWT 100 s Unit dBm

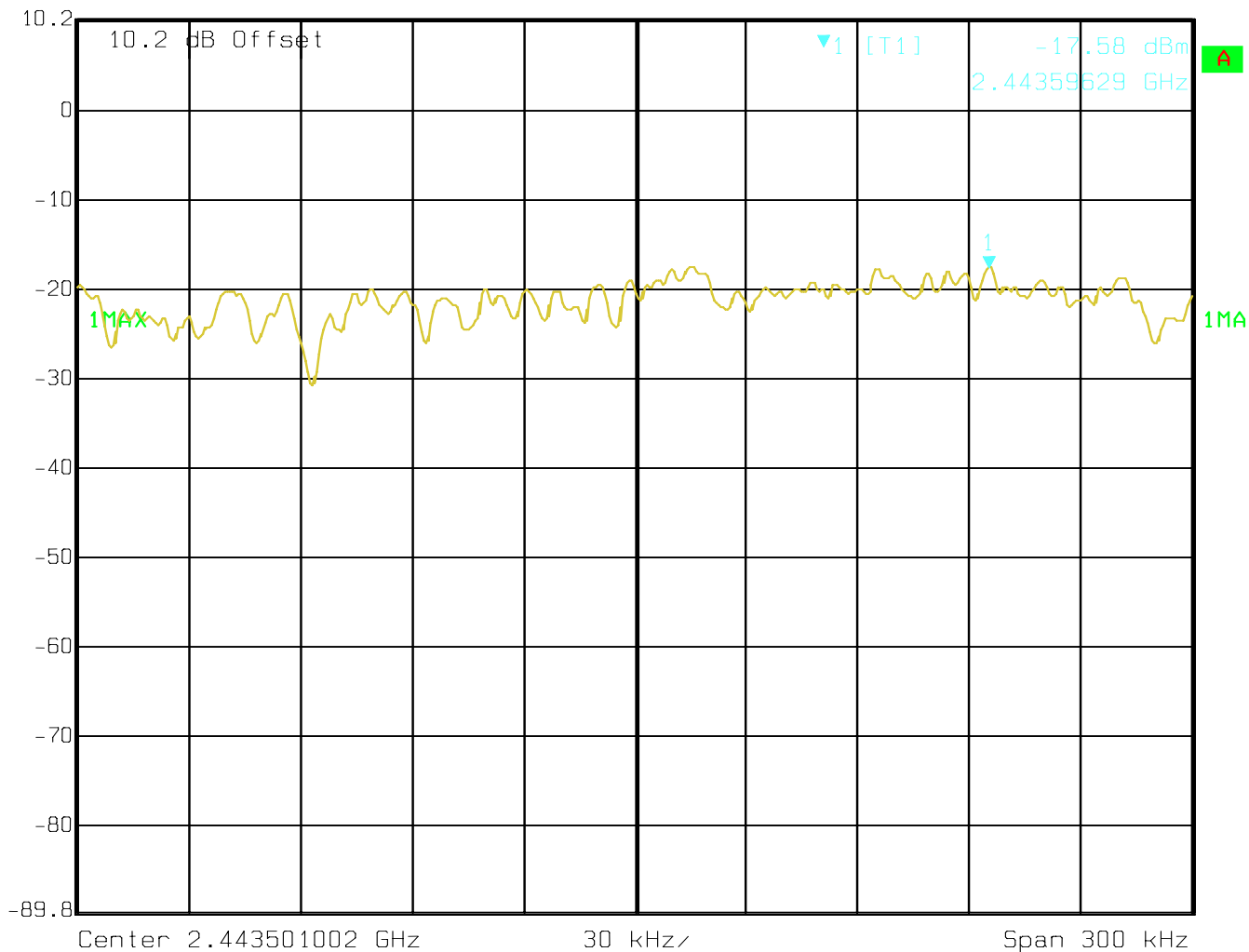


Date: 12.FEB.2010 15:20:33

802.11 g, Channel 6



Ref Lvl 10.2 dBm
 Marker 1 [T1] -17.58 dBm
 2.44359629 GHz
 RBW 3 kHz RF Att 30 dB
 VBW 10 kHz
 SWT 100 s Unit dBm

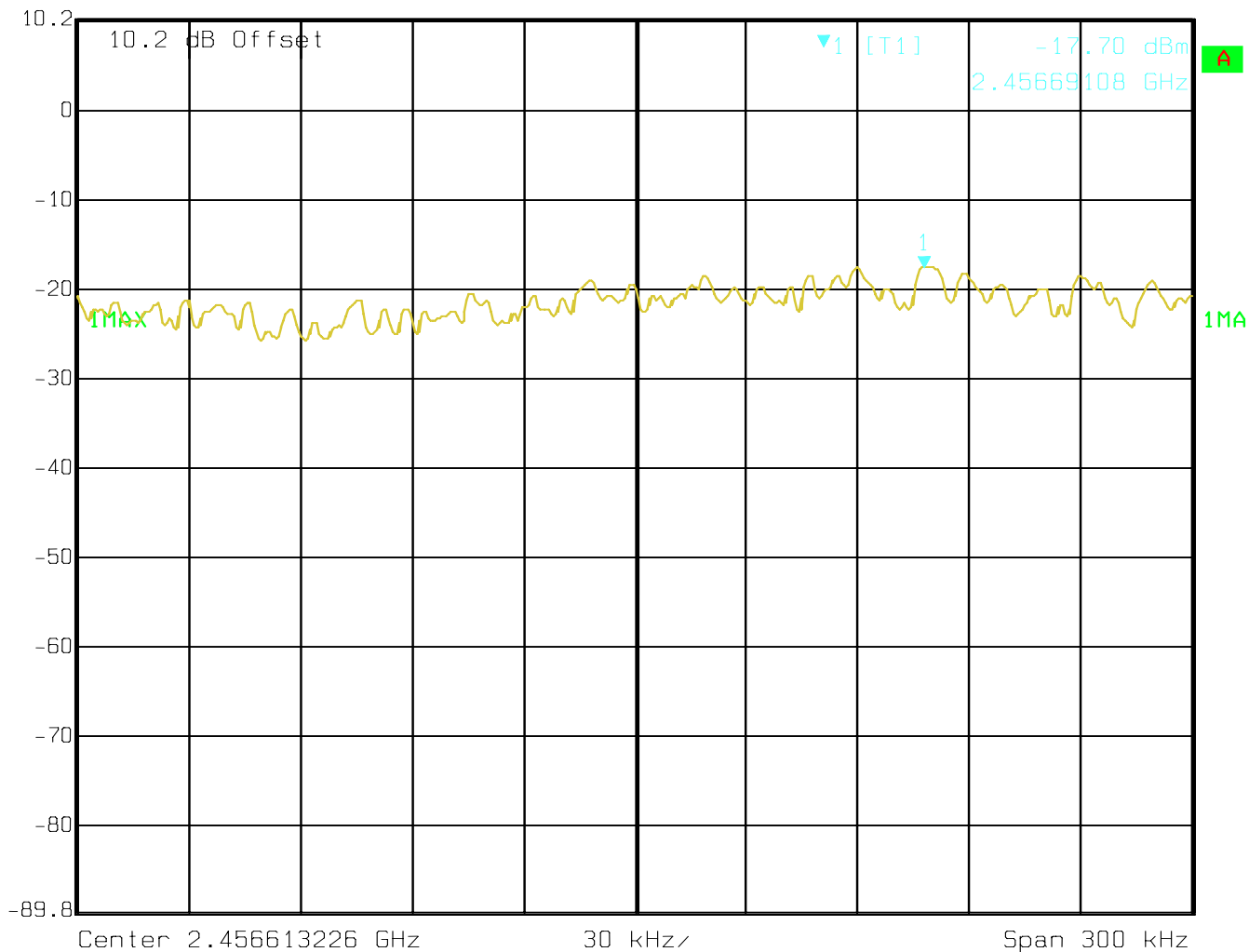


Date: 12.FEB.2010 15:31:09

802.11 g, Channel 11



Marker 1 [T1] RBW 3 kHz RF Att 30 dB
 Ref Lvl -17.70 dBm VBW 10 kHz
 10.2 dBm 2.45669108 GHz SWT 100 s Unit dBm



Date: 12.FEB.2010 15:52:42

5.4 Conducted Spurious Emission

5.4.1 Limit

§15.247(d): -30dBc

5.4.2 Results:

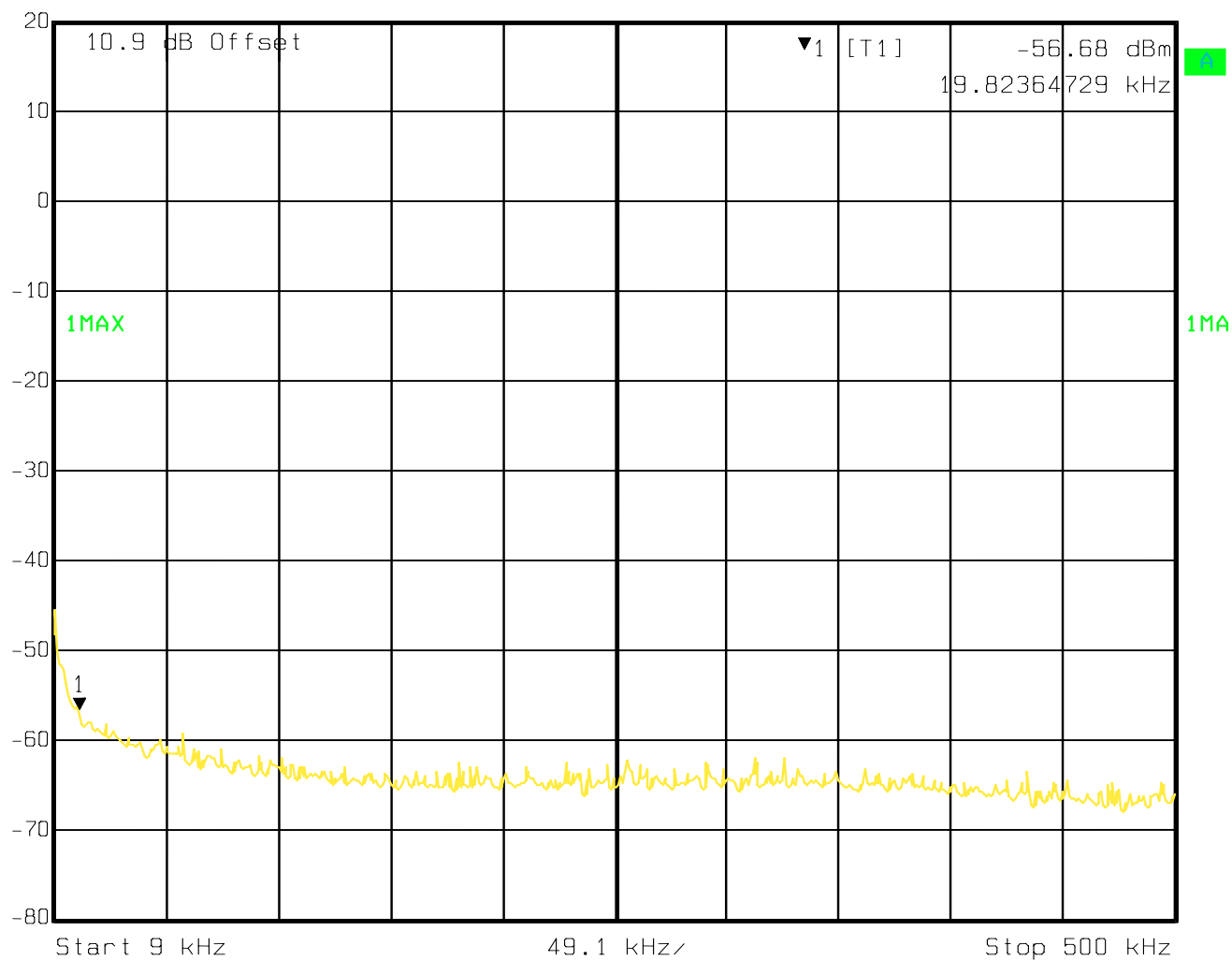
TEST CONDITIONS $T_{nom}(23)^{\circ}C$, $V_{nom}VDC$	Channel Frequency	Verdict
Sub-band 1: 2400-2483.5MHz (802.11g)	2412	PASS
	2437	PASS
	2462	PASS
Co-location with Bluetooth	BT: 2442 WLAN: 2412	PASS

Plots represent worst case of all modes.

5.4.3 Plots

802.11 g, Channel 1, 9kHz-500kHz


 Marker 1 [T1] RBW 3 kHz RF Att 30 dB
 Ref Lvl -56.68 dBm VBW 30 kHz
 20 dBm 19.82364729 kHz SWT 140 ms Unit dBm

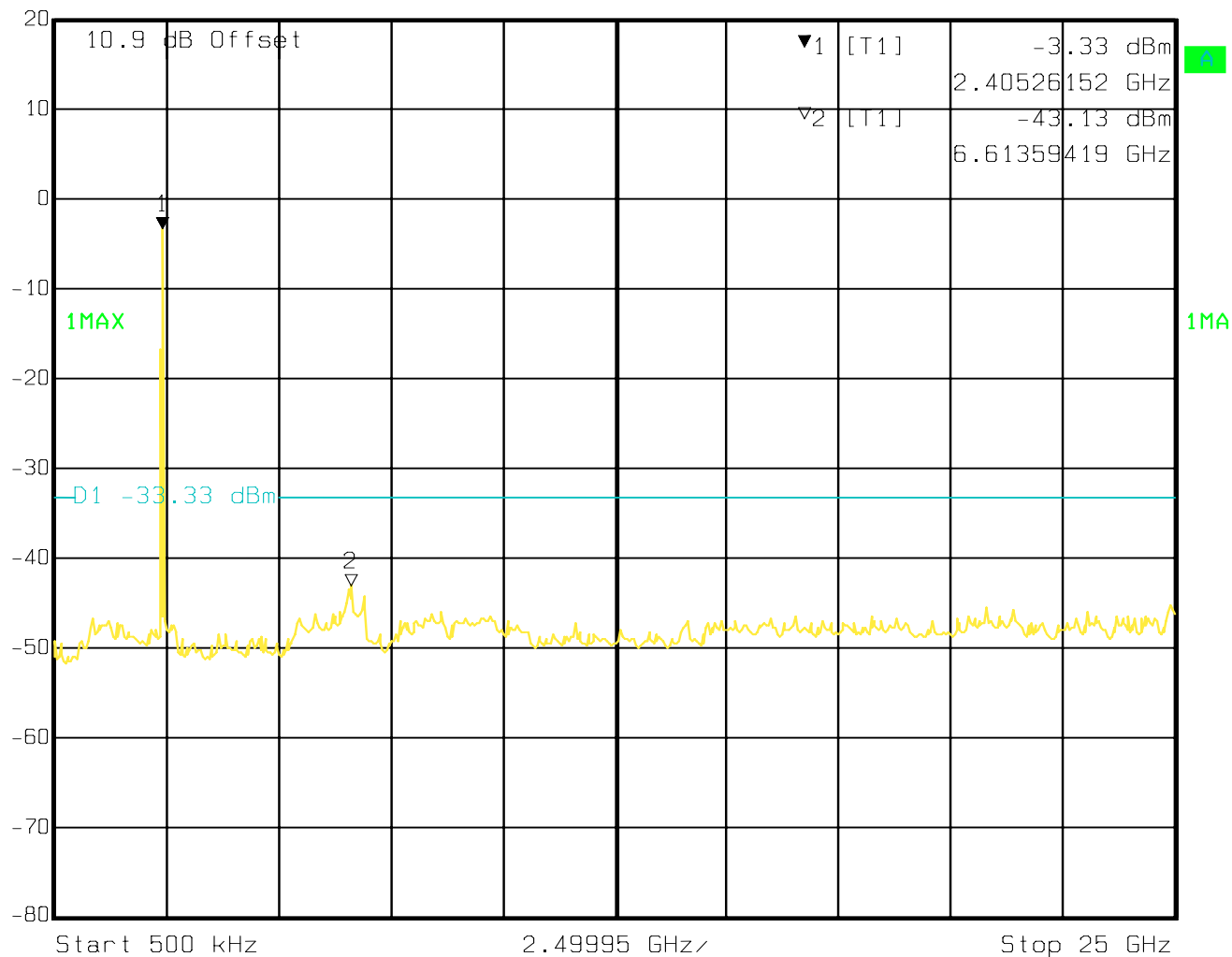


Date: 13.JAN.2010 17:55:55

802.11 g, Channel 1, 500kHz-25GHz



Ref Lvl 20 dBm
 Marker 1 [T1] -3.33 dBm
 2.40526152 GHz
 RBW 100 kHz RF Att 30 dB
 VBW 100 kHz
 SWT 6.4 s Unit dBm

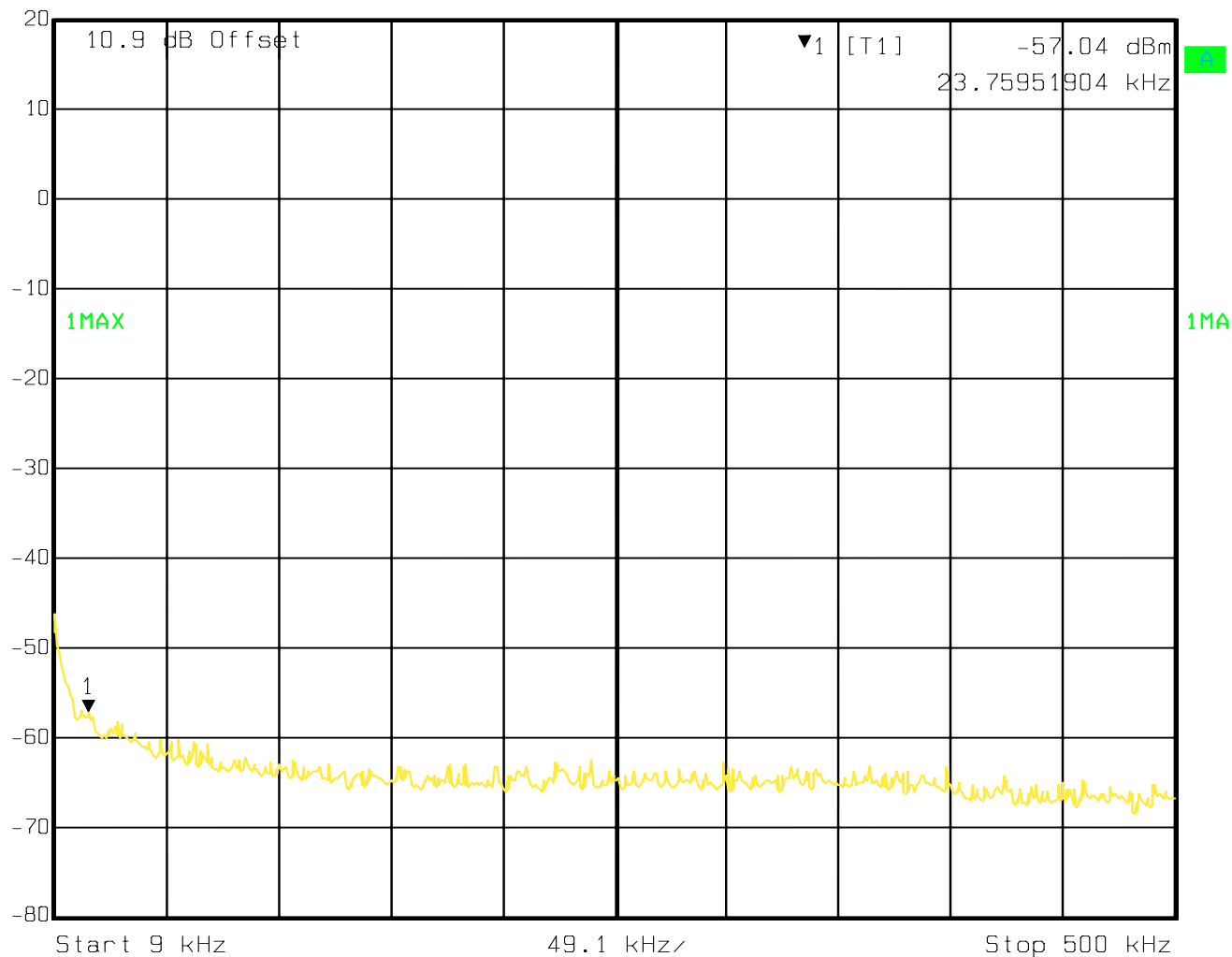


Date: 13.JAN.2010 17:53:53

802.11 g, Channel 6, 9kHz-500kHz



Ref Lvl 20 dBm
 Marker 1 [T1] -57.04 dBm
 23.75951904 kHz
 RBW 3 kHz RF Att 30 dB
 VBW 30 kHz
 SWT 140 ms Unit dBm

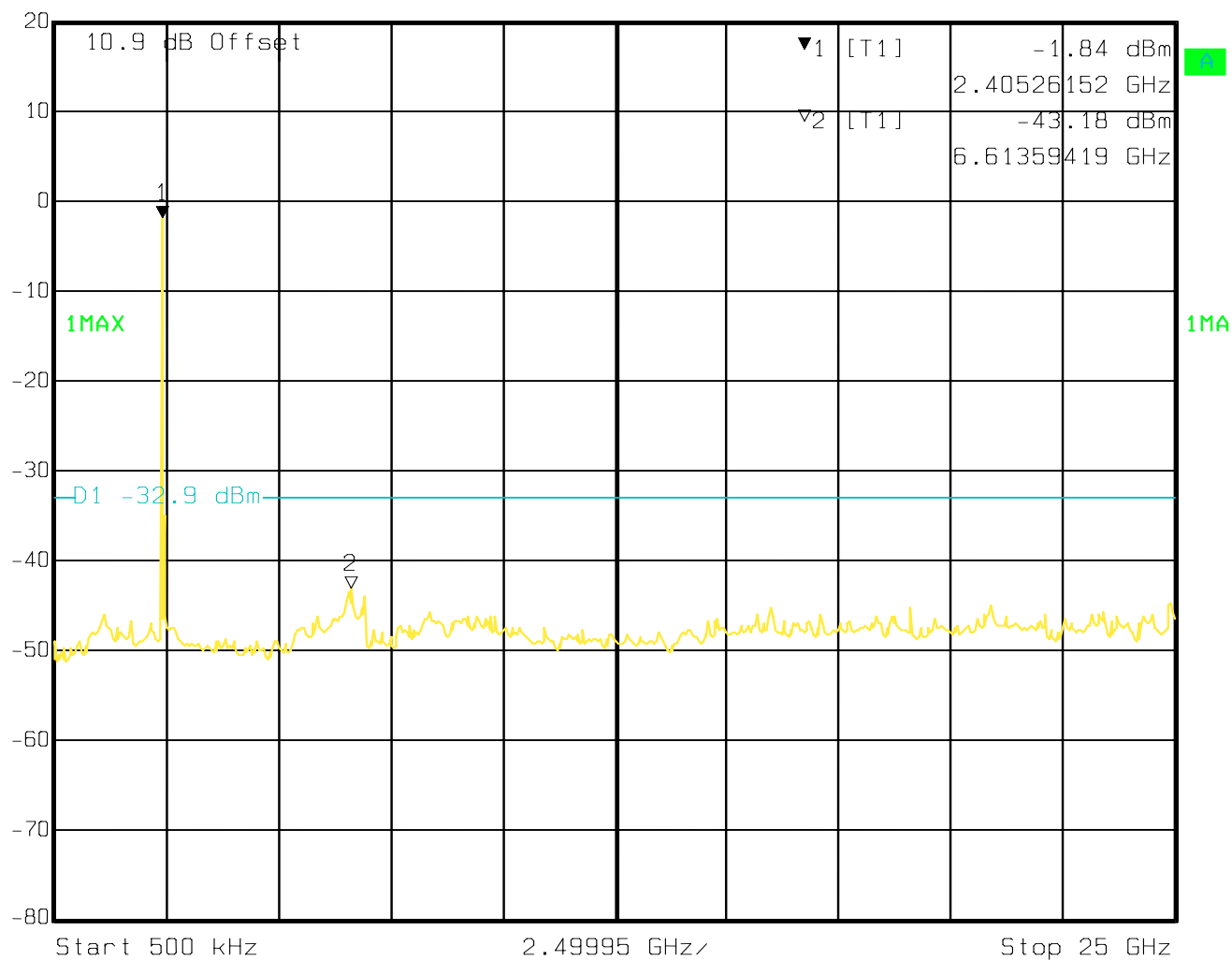


Date: 13.JAN.2010 17:57:12

802.11 g, Channel 6, 500kHz-25GHz



Ref Lvl 20 dBm
 Marker 1 [T1] -1.84 dBm
 2.40526152 GHz
 RBW 100 kHz RF Att 30 dB
 VBW 100 kHz
 SWT 6.4 s Unit dBm

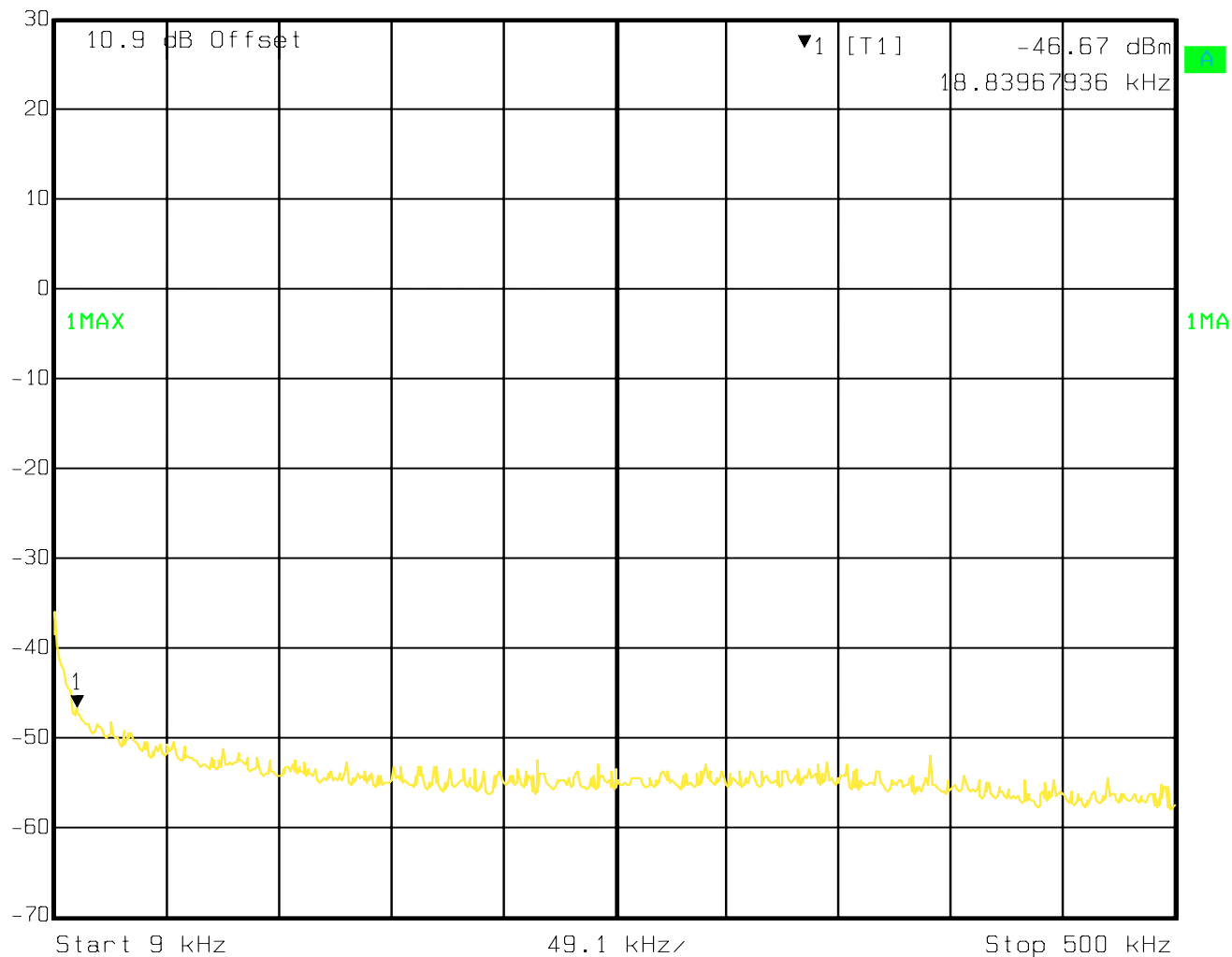


Date: 13.JAN.2010 17:51:27

802.11 g, Channel 11, 9kHz-500kHz



Ref Lvl 30 dBm
 Marker 1 [T1] -46.67 dBm
 18.83967936 kHz
 RBW 3 kHz RF Att 40 dB
 VBW 30 kHz
 SWT 140 ms Unit dBm

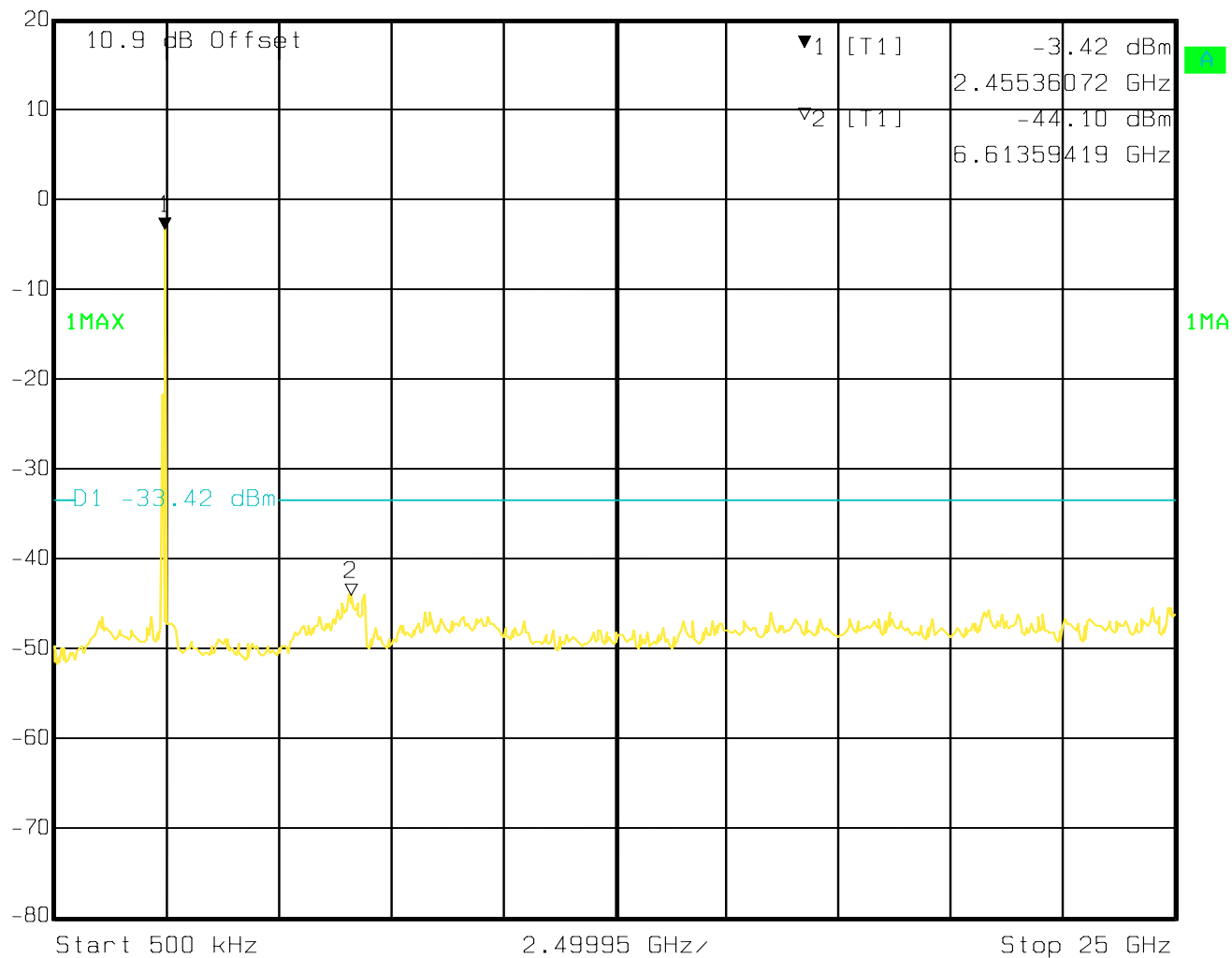


Date: 13.JAN.2010 17:44:38

802.11 g, Channel 11, 500kHz-25GHz

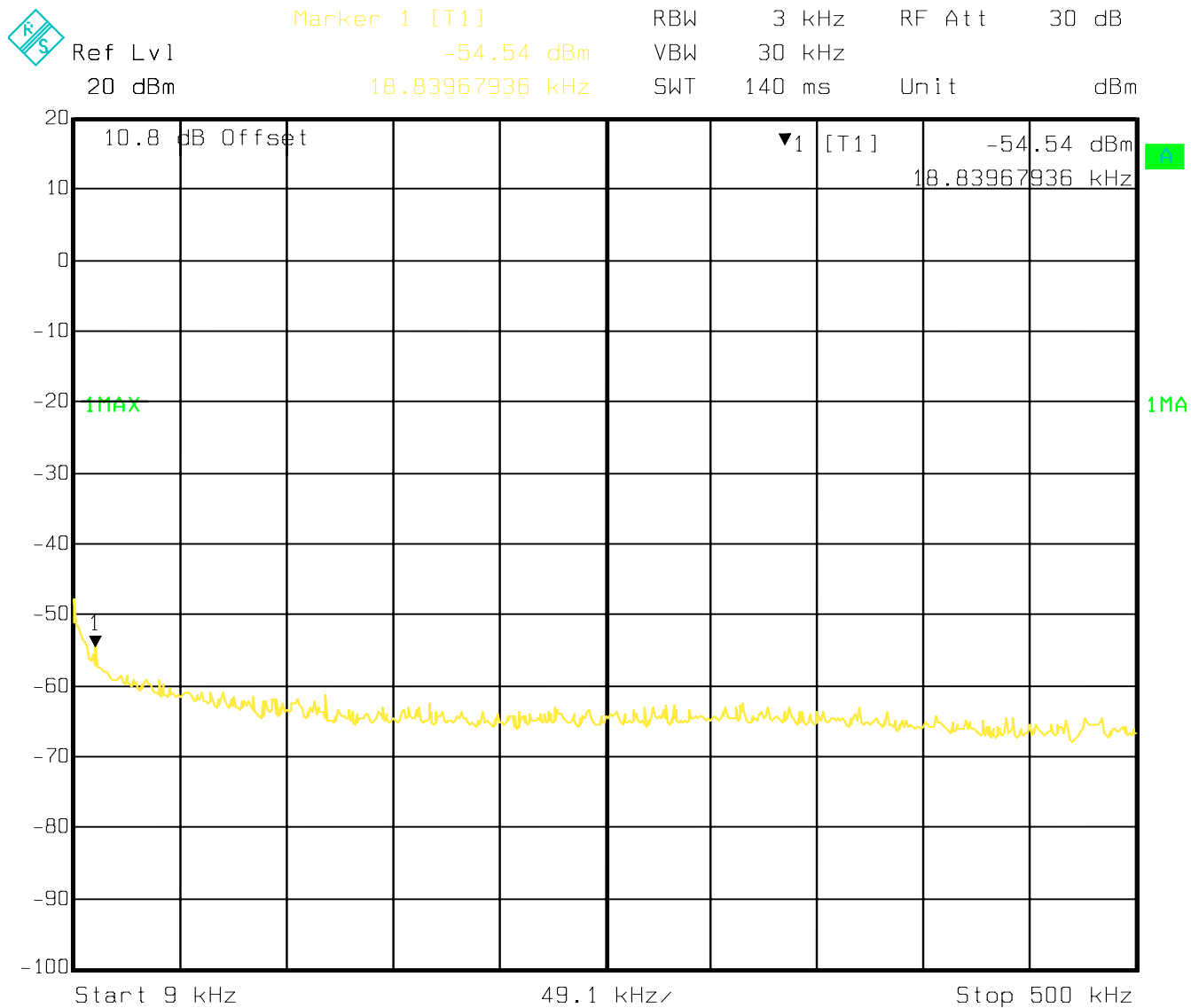


Marker 1 [T1] RBW 100 kHz RF Att 30 dB
 Ref Lvl -3.42 dBm VBW 100 kHz
 20 dBm 2.45536072 GHz SWT 6.4 s Unit dBm



Date: 13.JAN.2010 17:52:43

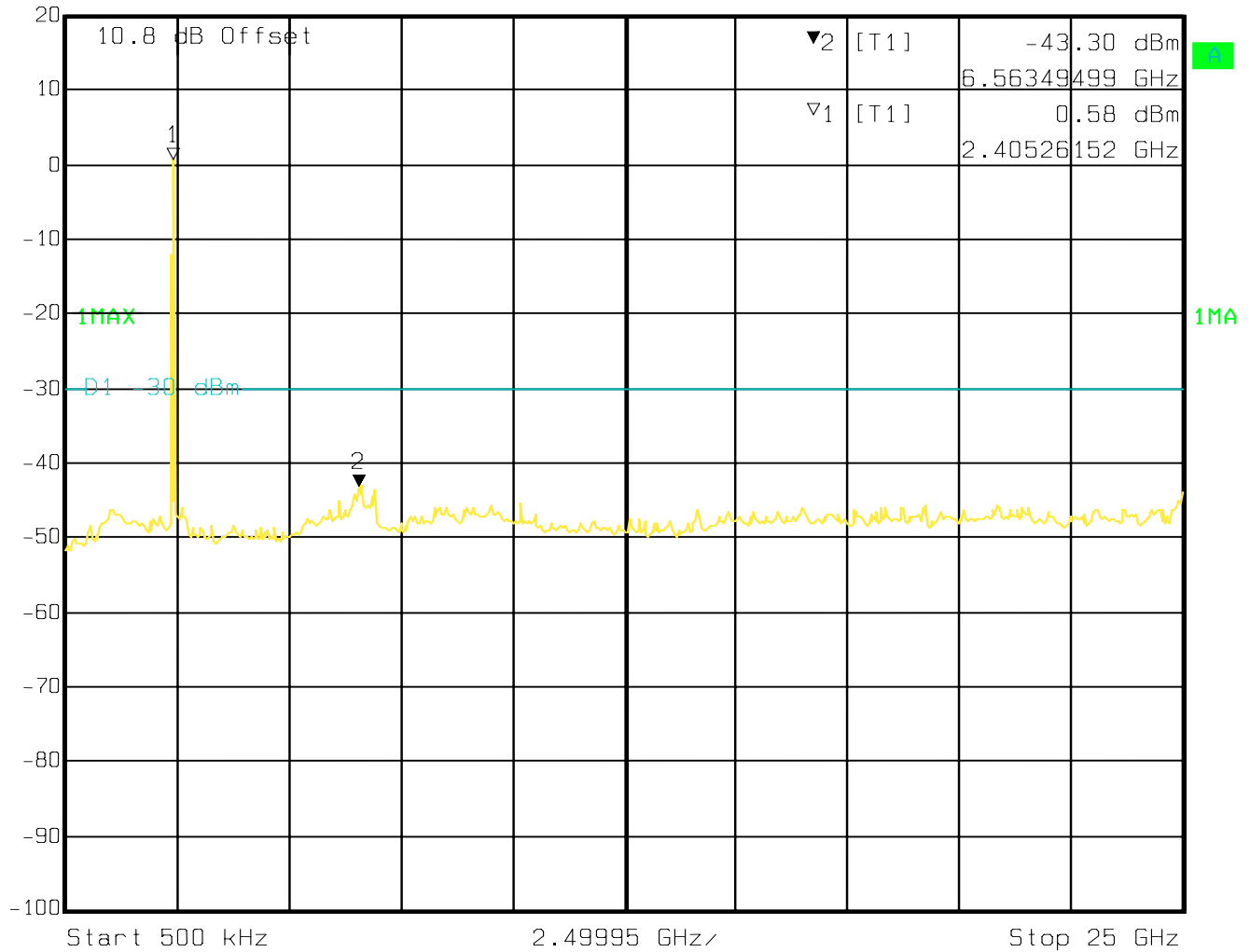
Co-location, BT: 2442 MHz, WLAN 2412 MHz, 9kHz-500kHz



Date: 22.JAN.2010 07:51:54

Co-location, BT: 2442 MHz, WLAN 2412 MHz, 500kHz-25GHz


 Ref Lvl 20 dBm
 Marker 2 [T1] -43.30 dBm
 6.56349499 GHz
 RBW 100 kHz RF Att 30 dB
 VBW 100 kHz
 SWT 6.4 s Unit dBm



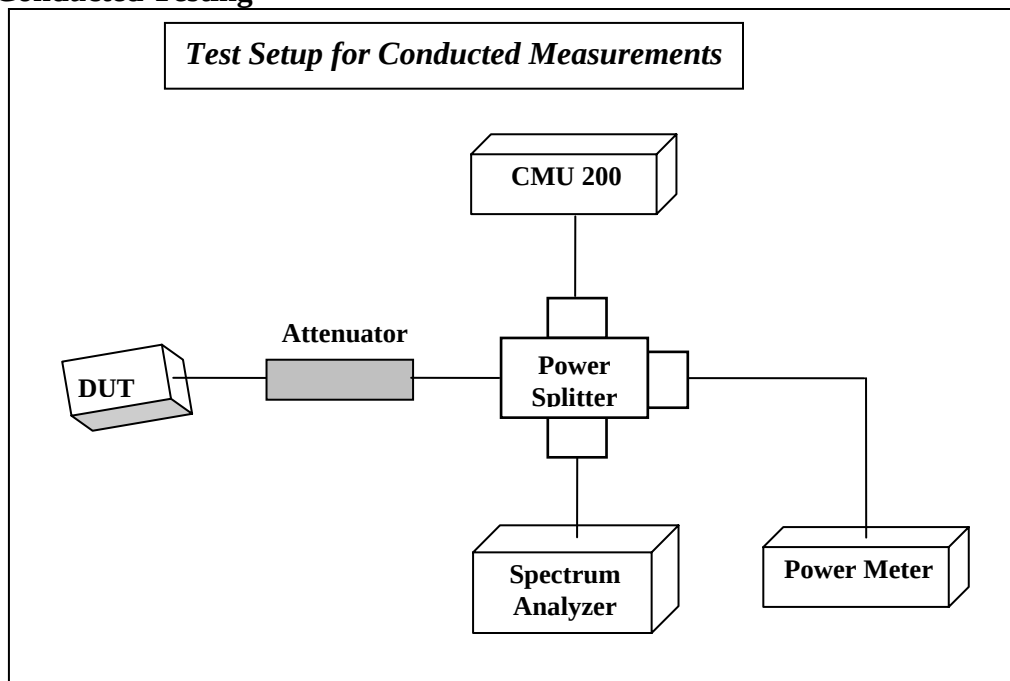
Date: 22.JAN.2010 07:54:28

6 TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

No	Instrument/Ancillary	Type	Manufacturer	Serial No.	Cal Due	Interval
01	Spectrum Analyzer	ESIB 40	Rohde & Schwarz	100107	May 2010	1 year
02	Spectrum Analyzer	FSEM 30	Rohde & Schwarz	100017	August 2010	1 year
03	Signal Generator	SMY02	Rohde & Schwarz	836878/011	May 2010	1 year
04	Power-Meter	NRVD	Rohde & Schwarz	0857.8008.02	May 2010	1 year
05	Biconilog Antenna	3141	EMCO	0005-1186	June 2010	1 year
06	Horn Antenna (1-18GHz)	SAS-200/571	AH Systems	325	June 2010	1 year
07	Horn Antenna (18-26.5GHz)	3160-09	EMCO	1240	June 2010	1 year
08	Power Splitter	11667B	Hewlett Packard	645348	n/a	n/a
09	Climatic Chamber	VT4004	Voltsch	G1115	May 2010	1 year
10	High Pass Filter	5HC2700	Trilithic Inc.	9926013	n/a	n/a
11	High Pass Filter	4HC1600	Trilithic Inc.	9922307	n/a	n/a
12	Pre-Amplifier	JS4-00102600	Miteq	00616	May 2010	1 year
13	Power Sensor	URV5-Z2	Rohde & Schwarz	DE30807	May 2010	1 year
14	Digital Radio Comm. Tester	CMD-55	Rohde & Schwarz	847958/008	May 2010	1 year
15	Universal Radio Comm. Tester	CMU 200	Rohde & Schwarz	832221/06	May 2010	1 year
16	LISN	ESH3-Z5	Rohde & Schwarz	836679/003	May 2010	1 year
17	Loop Antenna	6512	EMCO	00049838	July 2011	2 years

7 BLOCK DIAGRAMS

Conducted Testing



8 Revision History

2010-03-09: First Issue

2010-03-16: Removed references to Industry Canada and UMTS. Updated FCC ID and model number.
Replaces previous report number.